Forestry

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Vol. IX, No. 10

EDITORIAL

January, 1939

CONVERSATION OR CONSERVATION?

JUST as the curtain drops on the final act amid the thundering applause of an enthusiastic play-going audience, so has come to a close one of the greatest hunting seasons for both large and small game in Pennsylvania for many years. At least that seems to be the general opinion among most of the hunters throughout the Commonwealth.

Small game, particularly rabbits and ringneck pheasants, were unusually abundant, and other popular species such as grouse, quail, wild turkeys and squirrels showed up remarkably well despite the fact that their ranks had been alarmingly depleted by the severe winter of 1935, and the subsequent sleet storms and floods in the spring of 1936. Gratifying too is the fact that there is apparently a fine lot of small game seed stock remaining. This is occasioned on the one hand by the unusual abundance of certain species, and on the other by the fact that so many hunters upheld the true ideals of good sportsmanship by refusing to shoot the limit.

The antlerless deer season, according to early reports available when this was written, went off exceptionally well, notwithstanding the heartaches of those who unintentionally killed deer with visible antlers or horns. Unfortunately too many hunters took chances at unreasonable ranges. However, there seems to be no way to avoid these errors in judgment. The fact that so many of these hunters reported their own mistakes and paid their $50.00 speaks volumes for the high degree of true sportsmanship evidenced on all sides.

True, there were entirely too many instances of deliberate, illegal and lawless shooting, but in view of the general good law observance which was manifested by the vast majority of sportsmen, these violations have had no serious effect on the remaining supply.

The problem now before the sportsmen, especially in view of early heavy snows, is to feed and protect the seed stock of our game which remains. In other words, the show is not over, and their enjoyment must not cease with the dropping of the final curtain. There is an important sequel to the play in which they took such a successful part. They dare not let their enthusiasm wane, either individually or collectively.

To enjoy good hunting next season they must accelerate their plans for an intensive winter feeding campaign—Act I of the sequel. It is not always easy for a hunter to contemplate a trek through the deep snow with a sack of grain on his shoulder and an axe in his hand, and he may shudder inwardly at the mere thought of such a foray. Too often he feels that after he cleans and puts his gun away at the end of the season his responsibilities are ended. What a sad misconception of the true spirit of conservation! Even among sportsmen's associations there are always those who would rather practice conversation than conservation, and were it not for the foresightedness of thousands of active members game would be hard put during severe winters—and there would be infinitely less in the coverts ere another season rolled around. You can't feed game just talking about it. Deeds speak louder than words!

Every sportsman should regard himself as a business man, and while hunting from the standpoint of his ethics is by no means a commercial proposition, he must realize that the bag taken annually is a result of effort, either financial or physical. In other words, he's in the business of assuring for himself a continued supply of game from one season to another; therefore he must protect and feed his seed stock when natural food is scarce, or when it is covered with deep snow.

Likewise, he must guard that remaining supply against encroachment of winged and four-footed predators. Game has many enemies. Predators have comparatively few, of which Man is probably the most aggressive. Every sportsman owes it to himself, to his fellow hunters, and above all to the game itself, to make predator control Act II in the sequel. When the curtain is rung down on the second part of the play let him not find himself lacking or having failed to play his part well.

In the closing scene of the sequel, as Old King Winter lays his white mantle over the fields and woodlands, and when life becomes a drama indeed for creatures of the wild, may every hunter symbolize the spirit of sportsmanship by imparting its ideals to those who have not yet learned the proper ethics of rod and gun to the end that the younger generation—the sportsmen of tomorrow—will have caught the same fine spirit, thus making it possible for these young people to acquire and uphold the traditions of the finest and most wholesome sport in the world—HUNTING.

BIG BUSINESS

THE scenes enacted in Pennsylvania probably were without parallel since the days the buffalo roamed the plains of the west and the white man and the red took what they wanted.

The best estimates are that a minimum of 5,000 antlerless deer were killed in an area approximating a 50-mile radius of Oil City. There are five days of the season left. But all the authorities agree that a kill of these proportions is a good thing for the herd, for the sport and for those whose farms have been feeling the drain of feeding a heavy excess of female deer.

Five thousand animals of an average weight of 100 pounds means half a million pounds, or 250 tons of meat. At five cents a pound this is $25,000 worth of good food. To many a poor family this comes as a Godsend. It is probable that the kill in the State for the six days will total 150,000, equivalent to 7,500 tons, a really substantial contribution to the food supply of the state and to its wealth.

When we estimate the total business furnished by guns, ammunition, licenses and outfits, the wear and tear on cars and the gas and oil consumed, for which we have no figures, we must conclude that the wildlife industry in Pennsylvania has reached the stage of big business. It is well handled by the authorities and properly respected by the hunting fraternity. When out of this enormous kill in this vicinity only about 15 illegal cases are reported in Venango county, it is a tribute to the effectiveness of such organizations as the Bucktails and the good sportsmanship of the hunting public.

This year conditions were ideal. The weather was just right and the snow extremely useful. Also the does escaping slaughter for the past three years were easy prey for the marksmen. They will be more wary during the remainder of the season. But what is particularly gratifying is that with an army of hunters in the field not a single case of accidental shooting was reported in this vicinity, indicating that the hunters went out with a due sense of responsibility. It was a field day for the sportsmen. —*The Oil City Derrick.*

Part Payment

by ROBERT F. KEAGLE

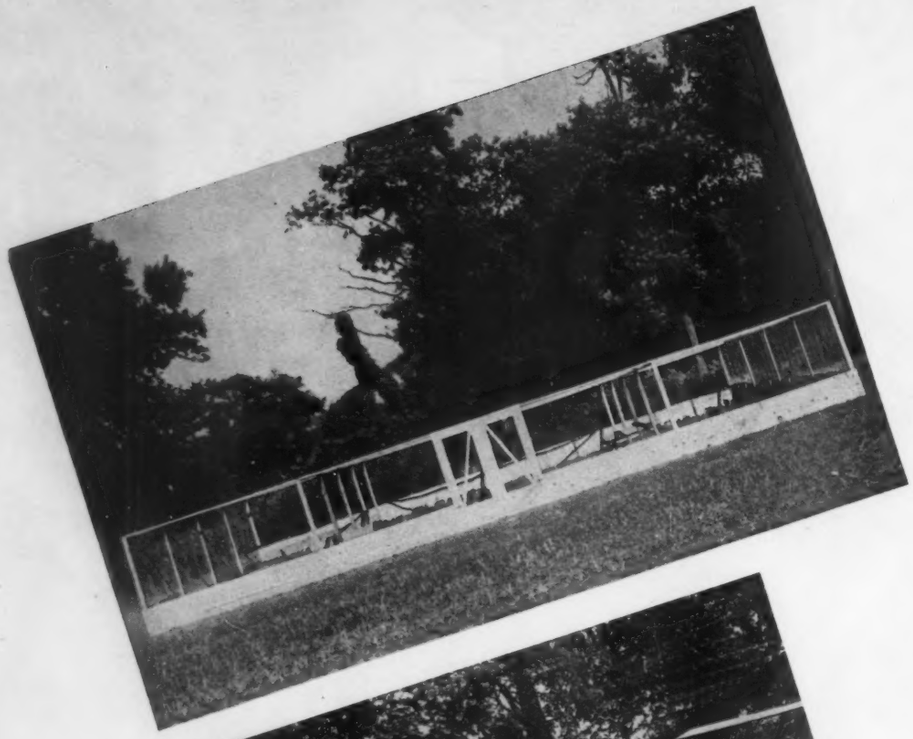
With hunting season over and guns all put away
No sportsman needs to feel his work is done;
It was very fine in season to enjoy the quest for game
But now the time for payment has begun.
For hunger stalks the out-of-doors and desolation rules
Where lately plenty reigned with lavish hand
So a task confronts the sportsman, a challenge to each one,
That should the heart of every man expand.
The rabbit and the ringneck the ruffed-grouse and the quail,
That escape the hunter's gun, needs help from you;
The doe deer in the thickets weakened by the cold
Needs food if she can hope to winter thru.
Go out to these enhungered ones and ease their suffering
And thus a real appreciation show,
Then reap the satisfaction that will be justly yours
For having paid a part of what you owe.

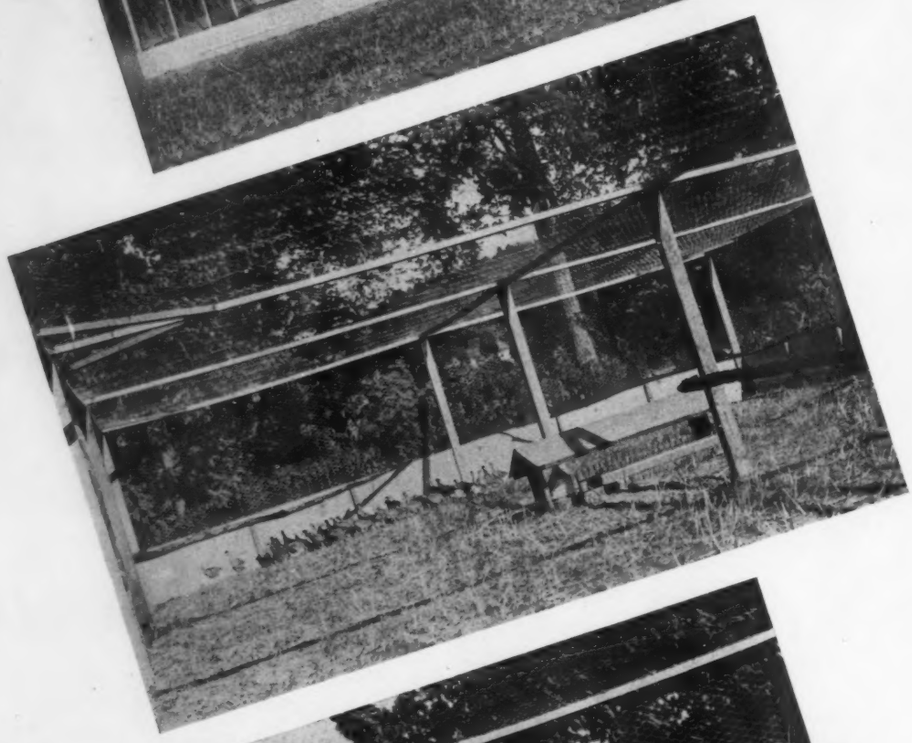
• WHEN

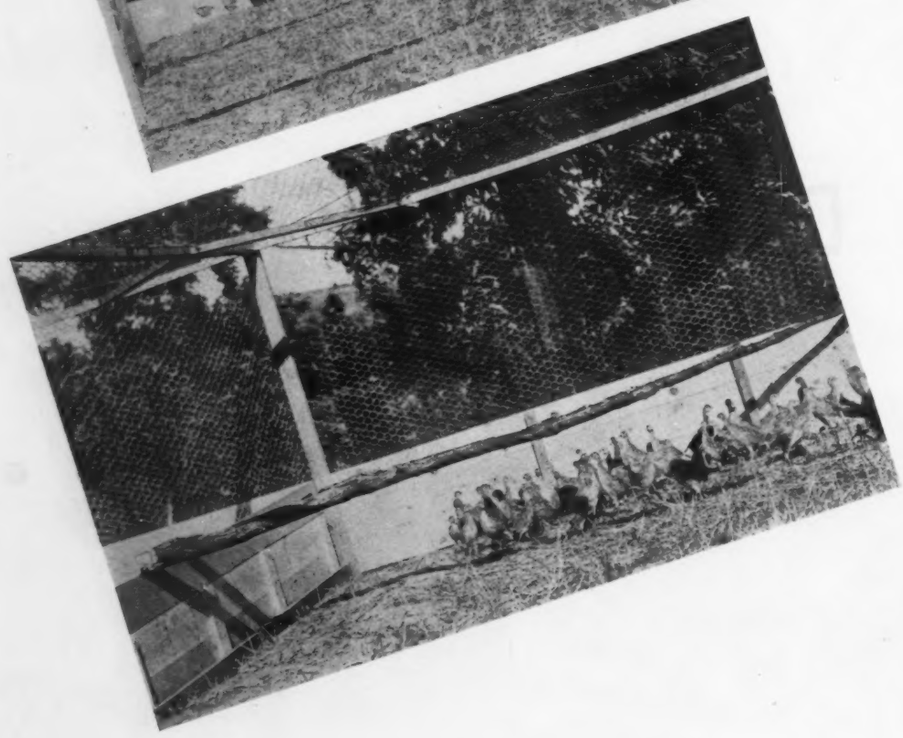
DUTY

CALLS

• • •







Approved type, double holding pen for Ringneck Pheasants. Size, 48′ x 48′. Capacity, 100 birds.

Interior view of approved type, single Ringneck Pheasant holding pen. Size 24′ x 48′. Capacity 50 birds.

It is important to place large roosts across corners of the pens.

• THE

IN an endeavor to increase the distribution of Ringneck Pheasants in counties suited to them throughout the state, and supplementing a maximum game bird production on the State Game Farms, the Game Commission has adopted a policy providing for the distribution of six-week old pheasants to sportsmen's organizations for further rearing.

A limited distribution of these birds to those organizations providing approved type holding pens and operating under special regulations has been authorized by the Commission to begin during the season of 1939.

The six-week old pheasant program will supplement and not replace the Commission's present policy of distributing day-old Ringneck Pheasant chicks to approved applicants. Applications for both can only be obtained from and filed with the District Game Protector.

Six-week old pheasants, in limited numbers, will be distributed under the following rules and regulations, and applications will be honored within the county quota, in the order received.

RULES AND REGULATIONS

Applications and Eligibility

1. Six-week old pheasants are available only to regular Sportsmen's Organizations, working in the public interest, *preferably County-wide Federations*, upon application from authorized representatives. No six-week old pheasants will be shipped to individuals or other organizations.

2. All applications must be secured from and filed with the District Game Protector, *in duplicate*, between January first and March first of each year.

3. Applications received after March first will be placed on a "Supplementary Shipping List" with no guarantee of delivery.

4. Applications are required to construct holding pens in accordance with the Game Commission's specifications. *Construction of these pens to be completed before* applications can be approved. Working drawings of approved type pens are available on application to the District Game Protector only. Pens of any other type or size *will not be approved.*

5. Applications will not be accepted from Counties unsuited to Ringneck Pheasants, and where it is known that a shootable supply of such birds cannot be developed and maintained.

6. No less than 50 and no more than 300 birds will be permitted to any one organization, except in the case of Federated Counties

SIX-WEEK OLD PHEASANT PROGRAM

How the Game Commission Will Distribute Young Birds for Rearing by Sportsmen

By CHARLES W. WESSELL

where a maximum of 1000 birds to a County-wide Organization will be allowed.

Rules for Holding Birds

1. Six-week old pheasants will be shipped *charges collect* or may be called for at designated State Farm.

2. All feed and other expenses (including transportation charges) incurred in connection with holding six-week old pheasants are assumed by the applicant.

3. Excepting the first season, when high quality sod would be acceptable, the soil inside holding pens must be thoroughly limed and turned over in the spring of each year. Clover or rape (or both) *must be sown* therein and Manchu soja beans, buckwheat, timothy, millet, sunflower, kafir corn and field corn can be added.

4. Complete sanitation must be practised and maintained in and around the pens at all times.

Liberations and Reports

1. No birds shall be liberated under 12 weeks old and all birds liberated must be *sound, healthy* and *full-winged.*

2. No more than 50 per cent of the total birds received may be held in pens after reaching the age of 16 weeks. The balance may be held no later than March 20th.

3. All birds shall be liberated in cooperation with the District Game Protector prior to March 20th, and he or his accredited representative *is required to be present* when liberations are made. The District Game Protector shall inspect all birds at the time of liberation.

4. All birds raised *must be liberated on lands open to public hunting.*

5. *Report forms* will be furnished with each application blank, to be completely filled out and *returned to the District Game Protector, after all birds have been liberated.* These reports to be filed prior to April first.

6. Applicants failing to return complete reports of birds liberated *will not be eligible* to receive future shipments of six-week old pheasants from the Game Commission.

General Provisions

1. The Game Commission reserves the right to reject or cancel the application of any Organization failing to adhere to the foregoing rules and regulations.

2. As distribution of six-week old pheasants is dependent upon State Game Farm production and based upon County quotas, the Commission reserves the right to reject new applications received after quotas are filled, and to reduce allocations of birds to approved applicants if and when Game Farm production shall fall below calculations.

HOW TO REAR SIX-WEEK OLD PHEASANTS

Common sense, sanitation, regularity and a willingness to follow instructions carefully are all that is required for successfully rearing six-week old Ringneck Pheasants to varying ages of from 12 weeks to maturity, and for holding them over the winter for spring liberation.

Pheasants at six weeks of age have attained their first complete feathering and no longer require the protection of brooders, brooder houses, etc. The birds are ready, at this age, to be placed in holding pens constructed on ground which *has never been used for poultry,* and which contains a good rich crop sown as described below.

The Holding Pens

Approved type holding pens, designed by the Commission and described as single (50 bird size, 24′ x 48′) and double (100 bird size, 48′ x 48′) *must be constructed in accordance with working drawings furnished on application to your District Game Protector.* In cases where more than 100 birds are to be reared single or double sections may be added to accomodate the number or birds applied for. Photographs of both single and double pens are shown on the accompanying pages.

The pens must be constructed on rich, well drained soil (sandy loam is best) and on fresh ground which has *never been contaminated in any manner.*

After the first season, during which high quality sod will be acceptable, the soil inside holding pens must be thoroughly limed and turned over in the spring of each year. Clover or rape (or both) must be sown therein, and strips of sunflower, field corn and buckwheat should be added. Manchu soja beans, timothy, millet and kafir corn are also beneficial. These sowings are very important to the health and well being of your birds.

A good quality green creosote shingle stain is recommended as the best and most economical preservative with which to paint your pens. This should be done, of course, before the wire netting is put on.

Care and Feeding

With your pens erected and the ground therein in readiness, you now prepare for receiving your birds.

At least two feed and water shelters of the type shown in the accompanying photograph should be provided for each 50-bird pen (24′ x 48′), together with two "no-bill" feeders and two 1-gallon glazed water fountains. A 100-bird pen (48′ x 48′) will require double that number, and so on. Complete details for constructing these shelters and obtaining the feeder and fountain are shown on the working drawings.

Large roosts, as shown in the accompanying illustration should be placed across the corners of the pens. These provide havens of escape for birds bullied by the larger ones and will be frequently used by all birds for drying off after rains and heavy storms.

When your pheasants arrive, place the shipping containers inside the pens, opening them enough to permit the birds to escape. Then back out of the pen, allowing the birds to come out at their leisure. They will soon make themselves "at home". Do not frighten and confuse them by shaking them out or pounding on the container.

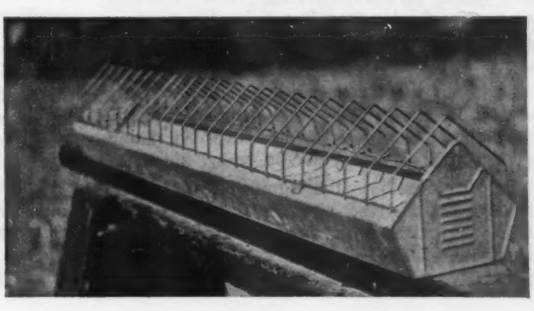
Your feeders should be filled half full of

(Continued on Page 30)

Approved type shelter for feeder and water fountain.

Glazed, earthenware water fountains are best and insure sanitation.

This "No-Bill" type feeder reduces feed waste to a minimum and permits a maximum number of birds to feed at one time.



Report on the Food

By JOHN R. LANGENBACH and ROBERT D. McDOWELL

Division of Game Research and Distribution

TABLE I

Method of Kill

	Male			Female			Sex Unknown			Totals	
	Mature	*Fledg.*	%	*Mature*	*Fledg.*	%	*Mature*	*Fledg.*	%	*No.*	%
Shot	214	...	54.3	223	...	62.4	18	...	39.1	455	57.4
Trapped	149	...	37.8	94	...	27.4	2	...	4.4	245	30.9
Miscellaneous	6	25	7.9	10	25	10.2	5	21	56.5	92	11.7
Total	369	25	100.0	327	25	100.0	25	21	100.0	792	100.0
% of Total	46.9	3.2	...	41.3	3.2	...	3.2	2.5	...	100.0	....

TABLE II

STOMACHS WITH FOOD

(No Fledglings included)

	Males				Females				Unknown	
Month	Shot	Trapped	Unknown	Total	Shot	Trapped	Unknown	Total	Shot	Total
Nov.	63	7	1	71	49	8	1	58	2	131
Dec.	7	16	1	24	11	15	...	26	...	50
Jan.	5	18	...	23	9	14	...	23	...	46
Feb.	13	14	...	27	15	8	...	23	...	50
Mar.	13	7	...	20	29	7	...	36	...	56
Apr.	17	7	...	24	20	3	...	23	...	47
May.	26	3	2	31	29	3	1	33	...	64
Total	144	72	4	220	162	58	2	222	2	444

STOMACHS EMPTY

(No Fledgings Included)

	Males				Females				Unknown			
Month	Shot	Trapped	Unknown	Total	Shot	Trapped	Unknown	Total	Shot	Trapped	Unknown	Total
Nov.	33	16	...	49	24	10	2	36	4	...	1	90
Dec.	5	13	...	18	7	10	1	18	6	1	...	43
Jan.	4	22	1	27	8	5	...	13	...	...	...	40
Feb.	5	14	...	19	1	4	...	5	...	...	...	24
Mar.	7	6	1	14	9	6	...	15	...	1	...	30
Apr.	5	3	...	8	6	...	4	10	1	...	...	19
May.	11	3	...	14	6	1	1	8	7	...	2	31
Total	70	77	2	149	61	36	8	105	18	2	3	277

TABLE III

Month	Shot No.	Shot % by Month	Shot % Total	Trapped No.	Trapped % by Month	Trapped % Total
Nov.	175	38.3	24.9	41	16.9	5.8
Dec.	36	7.9	5.1	55	22.4	7.9
Jan.	26	5.7	3.7	59	24.0	8.4
Feb.	34	7.5	4.8	40	16.3	5.7
Mar.	58	12.7	8.3	27	11.0	3.9
Apr.	49	10.7	7.0	13	5.3	1.9
May	79	17.2	11.2	10	4.1	1.4
	457	100.0	65.0	245	100.0	35.0

AT its July 1937 meeting the Pennsylvania Game Commission declared a bounty on the Great Horned Owl, *Bubo virginianus* in order to control this predator and study its food habits. The writers were assigned the latter task.

Information regarding the date and location of kill, as well as the name of the person presenting the bird, was readily obtained from bounty claims. Field officers also sent in birds for analysis, supplying additional information including the time of kill, and the type of cover and terrain in which the birds were killed. Close examination readily determined whether they had been trapped, shot, or otherwise killed. These notations as well as body, wing, and talon measurements, weights, and other necessary information were recorded.

In all cases of broken wings, missing feet, and other injuries affecting these measurements, the bird was rejected insofar as those measurements were concerned, in order to assure accurate findings.

Stomachs were removed from all birds, the contents alone, as they were upon opening the gastric wall, were weighed and recorded, plainly labeled, and preserved in 70% ethyl alcohol.

Before going into the significant analysis of weights, measurements, and food habits, it will be interesting to note the tables on the Method of Kill. (See Tables I and II). Table I gives the totals by sex as to methods of kill. This table is a compilation of Table II which gives the method of kill by month, with the exception of the fledglings. The fledglings were not included in Table II because they were all killed in March and April and were taken from the nest so that the method of kill is not significant.

The outstanding figure in this table shows that 175 out of 221 birds received, or 79%, of the birds taken in November were shot. This figure in percentage is bettered in May when 79 out of 95, or 83%, of the birds were shot. Both of these figures are readily explained. In the first case the small game season was in full swing *and it is very probable that these owls would have been shot regardless of the bounty.* In the latter case the sportsmen's competitive vermin control programs were at their peak and again it is quite likely these owls would have been killed *regardless of bounty.* This was especially noted in the many requests by the claimants to return the feet as evidence in the vermin control campaigns.

Careful notation of Table II shows a noticeable decrease in the number of birds shot in December and January, and then a gradual increase in the number shot in the latter months until it reaches the peak in percentage in May. This shows up prominently in Table III. Although these percentages are not the same as mentioned above, this is due to the fact that the above figures include the total number of birds received while Table III is based only on birds shot and trapped. Although there are 19 birds in the unknown column, it is not enough to warrant a place in Figure 1.

Habits Study of the Great Horned Owl

Division	A- 22	2.8%
Division	B-104	13.1%
Division	C-122	15.4%
Division	D-100	12.6%
Division	E- 91	11.5%
Division	F-284	35.8%
Division	G- 62	7.9%
Unknown	7	0.9%
	792	100.0%

The above table shows the number of birds killed in each field administrative division and the percentage of total for each division. Division "F" killed more birds than any other two divisions combined. In Division "F" about two-thirds of the birds were killed in the last three months of the bounty period, that is, March, April, and May. Although these figures are interesting, they are not particularly significant because the reason for this is not known.

Analysis of Weights and Measurements

The writers are confident that this is the largest number of Great Horned Owls that was ever examined from one locality in a seven-month period. It will be noted in Table III that only the average weight was calculated for birds with food in the stomach, and secondly, for birds in which the stomach was empty. This can be accounted for by the fact that the bird with the most food in it was not the heaviest bird, and the bird with the least food in it was not the lightest bird.

The outstanding fact in Table III is that the female is definitely larger than the male in every measurement made, with one exception; and that is the minimum length of talon in which case they are both the same. The talon measurements were not taken the first two weeks in November. At that time a method of definitely determining mature and immature birds was sought and there appeared to be a difference. However, as the number of measurements increased it became evident that this was not a distinguishing characteristic. In fact, it was later noted that there would be a difference in length of the corresponding talon on the feet of the same bird. It was further noted that this discrepancy was not constant as to left or right foot. However, not enough figures were taken to be included in this report. Another interesting fact was that the thickness of the talon would vary on different birds as well as the sharpness of the talon. These figures were not recorded, but probably should have been from an interest standpoint. However, micrometers accurate to minute measurements would be necessary for such figures to be of any value.

Although Table III is complete, the significant figures are those which show the average difference between female and male. The Bird that was the heaviest was not the bird that was longest, or had the greatest wingspread or the longest talon. This holds true for the smallest bird as well. The number of birds used to figure the average varies for each measurement because birds with broken wings, legs missing, tail or head missing, etc. could not be used for accurate measurements. Yet in some cases where wingspread could not be taken length could, and various other possibilities in a four-measurement setup.

TABLE IV

WEIGHTS AND MEASUREMENTS

	No.	Females	No.	Males	Difference Females & Males
Maximum Weight	...	5.10 lbs.	...	3.75 lbs.	1.35 lbs.
Minimum Weight	...	2.64 lbs.	...	1.55 lbs.	1.09 lbs.
Difference	...	2.64 lbs.	...	2.20 lbs.	0.26 lbs.
Average Weight Stomach Not Empty	209	3.875 lbs.	206	2.961 lbs.	0.914 lbs.
Average Weight Stomach Empty	94	3.625 lbs.	142	2.784 lbs.	0.841 lbs.
Difference	...	0.250 lbs.	...	0.177 lbs.	0.073 lbs.
Maximum Length	...	25.1 in.	...	23.2 in.	1.9 in.
Minimum Length	...	19.7 in.	...	19.1 in.	0.6 in.
Difference	...	5.4 in.	...	4.1 in.	1.3 in.
Average Length	317	21.912 in.	364	21.217 in.	0.695 in.
Maximum Wingspread	...	60.2 in.	...	56.2 in.	4.0 in.
Minimum Wingspread	...	51.4 in.	...	48.7 in.	4.7 in.
Difference	...	8.8 in.	...	7.5 in.	1.3 in.
Average Wingspread	307	55.841 in.	370	51.360 in.	4.481 in.
Maximum Talon	..	1.102 in.	...	0.984 in.	0.118 in.
Minimum Talon	...	0.748 in.	...	0.748 in.	0.00 in.
Difference	..	0.354 in.	...	0.236 in.	0.118 in.
Average Talon	259	0.918 in.	305	0.828 in.	0.090 in.

TABLE V

G. H. O. FOOD CHART—By MONTH

	Nov.		Dec.		Jan.		Feb.		Mar.		Apr.		May		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Rabbits	65	44.3	24	44.4	17	32.1	24	40.0	41	49.4	26	37.7	27	31.8	224	40.6
Rats and Mice	18	12.2	6	11.0	15	28.2	13	21.5	13	15.7	14	20.4	21	24.7	100	18.2
Shrew and Mole	2	1.4	1	1.9	2	3.8	..	...	1	1.2	1	1.4	4	4.7	11	2.0
Squirrels	7	4.8	1	1.9	2	3.8	4	6.7	6	7.2	1	1.4	5	5.9	26	4.7
Other Mammals	8	5.4	1	1.9	2	3.8	1	1.7	3	3.6	2	2.8	..	...	17	3.1
Poultry	8	5.4	9	16.7	3	5.7	..	...	3	3.6	3	4.3	6	7.0	32	5.8
Game Birds	4	2.7	..	...	..	...	4	6.7	..	...	1	1.4	2	2.4	11	2.0
Other Birds	23	15.6	8	14.8	7	13.2	10	16.7	13	15.7	7	10.2	4	4.7	72	13.1
Miscellaneous	12	8.2	4	7.4	5	9.4	4	6.7	3	3.6	14	20.4	16	18.8	58	10.5
Total	147	100.0	54	100.0	53	100.0	60	100.0	83	100.0	69	100.0	85	100.0	551	100.0
No. Times App.	147	26.7	54	9.8	53	9.6	60	10.9	83	15.1	69	12.5	85	15.4	551	100.0
No. Stom. Exam.	131	27.7	49	10.3	47	10.0	50	10.6	68	14.4	57	12.1	70	14.9	472	100.0
No. Stom. Empty	90	28.1	41	12.8	41	12.8	25	7.8	44	13.8	46	14.4	33	10.3	320	100.0
Total Received	221	27.9	90	11.4	88	11.1	75	9.5	112	14.1	103	13.0	103	13.0	792	100.0

Rabbits—Cottontail and Snowshoes.
Mice and Rats.
Shrew and Mole.
Squirrels—Red, Grey, and Flying.
Other Mammals—Muskrat, Weasel, Skunk, Bat, Undeterminate Mammal.
Poultry.
Game Birds—Ruffed Grouse, Quail, Ringneck Pheasant.
Other Birds—Large and Small Passerine Birds, Other Birds, Undeterminate Birds.
Miscellaneous—Insect, Snail, Snake, Fish, Crayfish, Amphibian, Vegetation, Unidentifiable.

Determination of Stomach Contents

The analysis of the stomach contents was not made immediately upon receipt of the bird, but the contents were preserved in alcohol for a period of four to six weeks to allow for the cessation of putrefaction.

After the analysis was begun the contents of each stomach were separated according to the various specimens present. If but one specimen was present the procedure was simplified considerably. The specimens were then identified to species wherever possible. This identification was determined by the presence of characteristic bones, skulls, bills, feet, appendages, fur or feathers. If the above mentioned anatomical parts were absent or were present in such a condition so as to defy identification, then the fur or guard hair was placed under the miscroscope and identified by comparison with samples of known fur or guard hair. In no case was an absolute identification based on a surmise. All doubtful specific identifications were put into a more inclusive group. This resulted in the recording of 32 different groups of food in the stomach contents.

Microscopic determination of species was limited to mammals. In some cases it was difficult to determine species from the examination of the fur because the fur varies on any individual mammal depending on the region from which it was procured. However, the guard hair from any particular species, or closely related group of species, is constant and can be identified with a considerable degree of accuracy.

Results of Stomach Analysis

The results of the stomach analysis are shown in Table V. This table is a condensation of the complete report on food habits by county by month for all 32 food classes. This latter report does not show anything significant but is kept in the files in the Harrisburg office.

Table V shows the diet of the owl broken down into nine food classes, from the original 32, as well as the percentage of food. The table is arranged so that the percentage for the food groups total 100% when read vertically, or the percentage is of the total for each month. For example: 44.3% of all food in November was rabbit. The remaining headings are read horizontally to total 100%, or the percentage

REPORT on FOOD HABITS of the GREAT HORNED OWL

The authors, McDowell (left) and Langenbach with part of a November day's mail of owls submitted for bounty.

is of the total by month. For example: 27.9% of all stomachs received were in November. This should explain the setup of this table.

In analyzing this table note that the greatest percent of rabbits was taken in March. This is the period when the young are making their greatest growth in the nest. Also, 112 or 14.1% of all birds received were sent in to the office in March. This is the largest number received in any one month, with the exception of November. To analyze the table briefly the total column, farthest to the right, will be considered. In this column 40.6% of all the food taken by the owls was rabbit. The owl's diet is largely of animals normally considered beneficial to man from one standpoint or another. If the total column is broken from nine food classes to three, namely beneficial, harmful and neutral, the food of the owl shows up as decidedly harmful to man.

In other words, only 18.2% of the owl's diet is normally considered harmful to man. If not directly harmful, the 18.2% is certainly not desirable to man.

This sufficiently describes Table V to establish the reader's interest to ferret out other interesting figures.

Although Table V is a complete report by month for nine food classes, it will be interesting to show the percentage as recorded for each of the 32 good classes. This is shown in Table VI. This table is taken from Food Charts I and II which show the food by county and number of each food class found in each stomach, and Food Chart II indicates the number of each food class as a class in each stomach. For example: If one stomach contained three mice, two shrews and two snakes, in Chart I it was recorded as that, while the same stomach recorded in Chart II would be mice once, shew once and snake once. This explanation should inform the reader as to the difference shown in Table VI between I and II.

At this time it is interesting to point out that in no stomach containing rabbit was there evidence of more than one rabbit. To analyze Table VI it is again evident of the great proportion of rabbits appearing in the owl's diet. The number column in Table VI indicates the number of times each food class appeared in the 492 stomachs containing food. The % of total column indicates the percentage of each food class in relation to the total number of times a food appeared. For example: Chart I shows that rabbit appeared 221 times or 36.6% of all the food classes combined, or 221 times out of 601 possibilities. The % of mammal column indicates the percentage of each food class in relation to the total number of times a food appeared as a mammel. For example: Chart I shows that rabbit appeared 221 times, or 53.2% of all the mammal food classes combined, or 221 times out of 415 possibilities.

Some of the interesting figures to point out

Beneficial		*Harmful*		*Neutral*	
Rabbits	40.6%	Rats and Mice	18.2%	Shrew and Mole	2.0%
Squirrels	4.7%			Other Mammals	3.1%
Poultry	5.8%			Miscellaneous	10.5%
Game Birds	2.0%				
Other Birds	13.1%				
Total	66.2%		18.2%		15.6%

are in the files at the Harrisburg office. Although not presented, Food Charts I and II will be described because Table VI is derived from them. Food Chart I indicates the total in Table VI are the increase in percentage between I and II when the number of times a food appears remains constant, as in the case of rabbit; and the decrease in percentage when the number of times a food appears decreases, as in the case of mice.

The relation between the three main groups of food classes is interesting in that 69% of the owl's diet is mammalian while only 21% is avian, and only 10% is in the miscellaneous group. Of this miscellaneous group approximately 35% is vegetation. This can be explained when it is realized that this vegetation evidently was not taken by the owl for the purpose of feeding on vegetation, but apparently was eaten along with other food, or had been eaten by the animal on which the owl had been preying. This latter was especially true where the owl had been preying on birds.

In analyzing the mammalian food the high percentage of rabbit should again be pointed out. The next significant figure is that when all the mice are included in one group. Although this is the second highest group it really is very low in comparison to rabbit.

In analyzing the avian food the high percentage of poultry must be carried in mind. Of course this is secondary to the class of undeterminate birds. This is readily accounted for by the fact that with only feathers absolute identification was many times impossible, and that in no case was an identification made on a guess. In the poultry group only one turkey was absolutely determined and there was no proof that it was either wild or domestic turkey. The bird was killed in Huntingdon, one of the best turkey counties. Although the Great Horned Owl is reputed as a turkey destroyer, this report should not be taken to show the owl does not kill turkeys, because relatively few birds were received from the "turkey counties".

The food class "other birds" included 7 Screech Owls, 1 Long-eared Owl, 1 Red-shouldered Hawk, 1 Sparrow Hawk, 1 Crow, and 1 Flicker. This alone shows the diversity in the owl's diet.

Table VII, although not particularly useful, is an interesting table in that it shows the maximum and minimum weights of the stomach contents. For instance, the heaviest weight of stomach contents was 5.414 ounces or over 1/3 of a pound. When with a bird that averages 2.961 pounds, from Table IV, it is possible to have 1/3 of a pound, or more than 1/9 of its total weight in stomach contents.

Conclusions and Recommendations

The writers feel confident that these 792 Great Horned Owls represent the largest number of such birds from one specific locality ever presented for diet analysis, within a seven month period. With this large number of specimens available, enough evidence may be obtained to substantiate a positive statement concerning the part that *Bubo virginianus* played as a resident bird of Pennsylvania during this period. After summing up the tables representing the food habits of this avian predator, it is an indisputable fact that the Great Horned Owl cannot be considered one of our beneficial birds of prey. Bearing in mind the fact that only 18.2% of the owl's diet can be considered as consisting of animals injurious to man, whereas 66.2% of the diet represents mammals and birds beneficial to humans, it proves conclusively that the legislature was wise in declaring this an [obnoxious and] unprotected

REPORT on FOOD HABITS of the GREAT HORNED OWL

TABLE VI

Food Class	No.	I % of Total	I % of Mammal	No.	II % of Total	II % of Mammal
Rabbits	221	36.6	53.2	221	39.6	57.1
Undeterm. Mice	41	6.8	10.0	40	7.2	10.4
Peromyscus	29	4.8	7.0	19	3.4	4.9
Microtus	26	4.3	6.2	17	3.0	4.4
All Mice	96	15.9	22.2	76	13.6	19.7
Rat	35	5.8	8.5	32	5.7	8.3
Shrew	16	2.7	3.9	10	1.8	2.6
Red Squirrel	13	2.1	3.1	13	2.3	3.4
Gray Squirrel	12	2.0	2.9	12	2.1	3.1
Snowshoe Rabbit	3	.5	.7	3	.5	.8
Muskrat	3	.5	.7	3	.5	.8
Bat	4	.7	1.0	4	.7	1.0
Skunk	2	.3	.5	2	.4	.5
Mole	1	.2	.2	1	.2	.3
Flying Squirrel	1	.2	.2	1	.2	.3
Weasel	1	.2	.2	1	.2	.3
Undeterm. Mammal	7	1.2	1.7	7	1.2	1.8
	415	68.9%	100.0%	386	69.0%	100.0%

Food Class	No.	I % of Total	I % of Birds	No.	II % of Total	II % of Birds
Poultry	33	5.5	26.4	32	5.7	27.8
Small Pass. Birds	13	2.1	10.4	13	2.3	11.3
Larger Pass. Birds	6	1.0	4.8	6	1.1	5.2
Other Birds	12*	2.0	9.6	11	2.0	9.6
Grouse	12	2.0	9.6	4	.7	3.5
Quail	4	.7	3.2	4	.7	3.5
Pheasant	3	.5	2.4	3	.5	2.6
Undeterm. Birds	42	7.0	33.6	42	7.5	36.5
	125	20.8	100.0	115	20.5	100.0

19 game birds 15.2% 11 game birds 9.6%

	No.	I % of Total	I % of Misc.	No.	II % of Total	II % of Misc.
Insect	19	3.2	31.1	19	3.4	32.7
Snake	10	1.7	16.4	7	1.2	12.1
Fish	3	.5	4.9	3	.6	5.2
Crayfish	4	.7	6.6	4	.7	6.9
Amphibian	2	.3	3.4	2	.4	3.5
Snail	1	.2	1.6	1	.2	1.7
Vegetation	21	3.5	34.4	21	3.8	36.2
Unidentifiable	1	.2	1.6	1	.2	1.7
	61	10.3	100.0	58	10.5	100.0

* Includes:

7 Screech Owl
1 Long-eared Owl
1 Sparrow Hawk
1 Red-shouldered Hawk
1 Crow
1 Flicker

TABLE VII

G.H.O. WT. STOMACH CONTENTS

	Female		Male	
	Grains	*Ounces*	*Grains*	*Ounces*
Heaviest	2183.9	4.992	2369.0	5.414
Heaviest 100% Rabbit	2183.9	4.992	2369.0	5.414
Lightest	0.9	0.002	0.2	0.0004
Lightest 100% Rabbit	41.5	0.094	1.3*	0.003

* One other stomach contained three hairs which were identified as rabbit but were not weighed.

Feathers and bones of small game birds and animals taken from the nest of one Great Horned Owl.

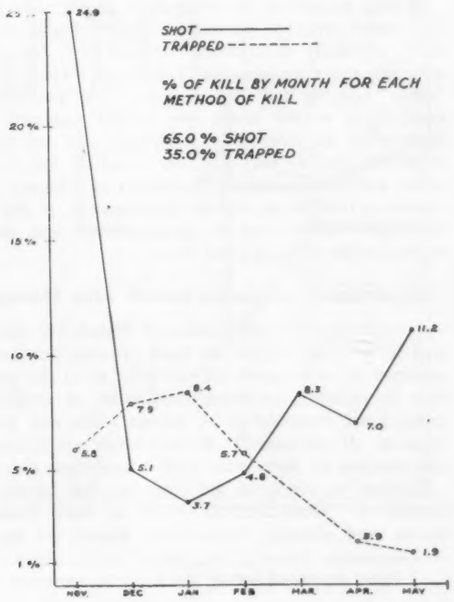
bird. The remaining 15.6% of the total diet includes reptiles, amphibians, crustaceans, fish, insects and vegetation. This group, under ordinary circumstances, is neither beneficial nor harmful to man; therefore it may be assigned a neutral classification.

Insofar as the declaration of a future bounty upon the Great Horned Owl is concerned, the writers believe it necessary to do so in order that further stomach analysis may be made. This work should by no means be neglected or considered completed after only one year's study. The past winter was very mild and open, the next one may be severe and of long duration; under these conditions there is a possibility that the present status of the owl may be somewhat altered.

The authors believe that control of this species is not effected by a bounty since the facts reveal that the greatest number of owls were shot during the open hunting season and in the spring of the year when vermin control campaigns were being conducted by the sportsmen. This would indicate that these birds would be killed regardless of the fact that a bounty had been placed upon them. The bounty alone, however, is responsible for the reception of a vast majority of the birds at Harrisburg for stomach analysis.

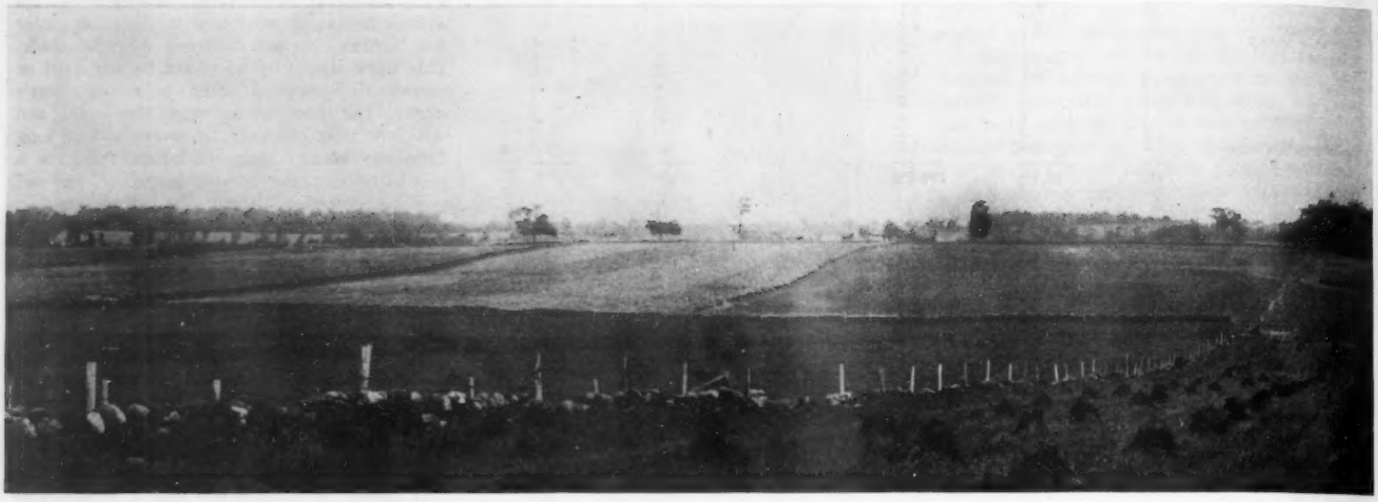
It should be pointed out that it is desirable to receive birds for study throughout the entire year. Under the present stipulation that birds be presented within 48 hours of killing, putrefaction makes a study almost impossible during the summer months. Perhaps a 24 hour limit would correct this matter, and make it possible for an uninterrupted analysis to be made. Under these conditions a bounty should be paid the entire year.

The writers wish to acknowledge the helpful assistance of the field force and various staff officers of the Pennsylvania Game Commission, and especially that cooperation extended by Harold L. Plasterer, Principal Bounty Claim Clerk. His knowledge of the various birds of prey and general predator conditions within the Commonwealth proved invaluable.



The Farm Fence in Wildlife Management and Erosion Control*

By FRANK C. EDMINSTER



Bare fencerows are not conducive to a good game supply. Where food and cover are scarce wildlife also is scarce.

OPEN land in farm crops or pastures is, in itself, generally inferior habitat for the majority of wildlife species in the Northeast. This is particularly true of sedentary forms, including all farm game birds. While species such as the meadowlark or field sparrow may find all of their requirements within a single field, most birds and the larger mammals need a diversification of cover types in their habitat and a variety of habitat types in their year-round territory. Variety in crops grown on a farm provides valuable changes in habitat, and the margins are "edges" of a sort, especially when fields are strip-cropped. But by and large, farm fields lack year-long shelter and are not secure in the major habitat attributes. Mowing, harvesting, grazing, or plowing will at one time or another remove the source of livelihood of the wildlife inhabitants.

Present Deficiencies in Wildlife Shelter on Farm Lands

Woody vegetation of one type or another and swales and swamps are the major types of permanent shelter found on farms of the Northeast. Properly distributed through the farmed land, they greatly enhance carrying capacity for most forms of farm wildlife. With "clean" farming and the utilization of all possible acres for crops, however, these shelter areas are usually confined to land not farmable because of physiographic conditions and are generally not well distributed. Or, we may say, as croplands are generally in continguous fields, extensive acreages are devoid of adequate protective cover. This condition reaches its highest development on the more fertile and high land-value farms and is progressively less marked on farms that approach the sub-marginal class.

Opportunity for Improvement Lies Mainly with Fence-rows

Considering the possibilities of remedying the deficiency in wildlife shelter, we must accept the basic premise that lands being farmed must continue to be cropped substantially as in the past. Cropping methods may be changed, as from block fields to strip-cropped fields, but the crops must continue to be grown. The one big opportunity for the creation of permanent shelter areas on cropped land lies in the revegetation of permanent field boundaries—the fence-rows.

Fashion as much as anything has led farmers to subscribe to the dictum of "clean-farming"—that is, bare fences and avoidance of weedy and shrubby vegetation. Based on the principle that such growth harbors pests inimical to crops, the practice of clean farming has also become a criterion of neatness. That the practice is detrimental has not lessened its use. It has become "the thing to do"; it is fashionable.

Actually, overgrown fence-rows, except where they contain alternate hosts of crop pests, are of more benefit than detrimental to crops for several reasons. They encourage weed seed and insect eating birds, which assist in pest control; act as a barrier to soil erosion; and form windbreaks for the protection of crops and soil. In many instances, also, they furnish additional farm crops such as berries and fence posts. Bates (1934) has discussed the beneficial effect of between-field cover in checking wind movement, reducing evaporation, altering air temperatures, and in increasing crop yields. He concludes: "With ordinary field crops the farmer may count on a benefit from windbreak protection which will make the loss of the area occupied by the trees negligible".

The problem is largely one of education. When it becomes stylish to have a dogwood hedge instead of a bare wire fence, there will be a dogwood hedge.

When it is considered good farming practice to allow fences to overgrow, man will be judged a good farmer when he does so. When the farmer has been shown the correct economics of brushy fences, it should not be difficult to change his aesthetic viewpoint. A fence row including foliage, flowers, and fruit certainly makes a more pleasing landscape than a stretch of galvanized wire. Other nations have learned the worth of such fences; it is time that Americans awake to an appreciation of a beautiful farm landscape. Grange and McAtee (1934) note that "the famed English countryside owes its beauty and general attractiveness largely to growths of vegetation between fields, so useful in breaking the monotony of crop lands."

I have indicated in a general way that the presence or absence of overgrown fences determines to a considerable extent the wildlife population of the farm. Obviously this is true only in proportion to the extent and distribution of other permanent wildlife shelter habitat. The need for brushy fences, as far as wildlife is concerned, is primarily on farm lands that lack adequate woods, swales and swamplands.

Relation of Farm Wildlife to Overgrown Fence-rows

The relationship of many species of wildlife to shrubby field boundaries may be illustrated by a study of the pheasant population on a

* Paper presented before Third North American Wildlife Conference, Baltimore, Maryland, February 15, 1938.

New York farm area. The writer made a survey of two square miles of farm land in Seneca County, New York, in 1933 and 1934, on which the pheasant was the primary game species. While by no means the best pheasant land in New York, this acreage was considered to be good pheasant range, probably representative of average New York conditions.

These two mile-square tracts were separate, surrounded by essentially similar land and bounded by roads. Vegetative cover in the two areas varied little, there being slightly more hay and pasture on Area No. 1 and a correspondingly larger quantity of woods and swales on Area No. 2. The proportions of the major cover groups are summarized in Table 1.

Table 1. Cover Types on Seneca County (N. Y.) Pheasant Study Areas

Cover Type	Acreage of Cover Types in Area No. 1		Acreage of Cover Types in Area No. 2	
	Acres	*Percent*	*Acres*	*Percent*
Woods and Brush	64	10.0	83	13.6
Swales	20	3.0	31	5.0
Pasture and Hay	316	49.5	273	43.2
Cropland	228	35.5	242	36.5
Misc.	12	2.0	11	1.7
Overgrown Fence Rows (Miles)		5.5 mi.		3.0 mi.

The most significant difference in cover conditions on the two areas was the variation in extent of overgrown fence rows, there being 83 percent more on the first area than on the second. This condition was in some measure offset by the eleven more acres of swale on Area No. 2 than on Area No. 1 but the swales were in relatively large tracts and hence not as well distributed as the fence-row cover. The pheasant-population data indicate clearly that the well scattered fence cover provided a much higher pheasant carrying capacity on Area No. 1. These data are shown in Table No. 2.

Table No. 2 Pheasant Populations on Seneca County (N. Y.) Study Areas

Date	*Pheasant Populations (Per Square Mile)* *Area No. 1*	*Area No. 2*	*Ratio*
August 1, 1933	51	20	2.5 to 1
March 1, 1934	21	13	1.6 to 1

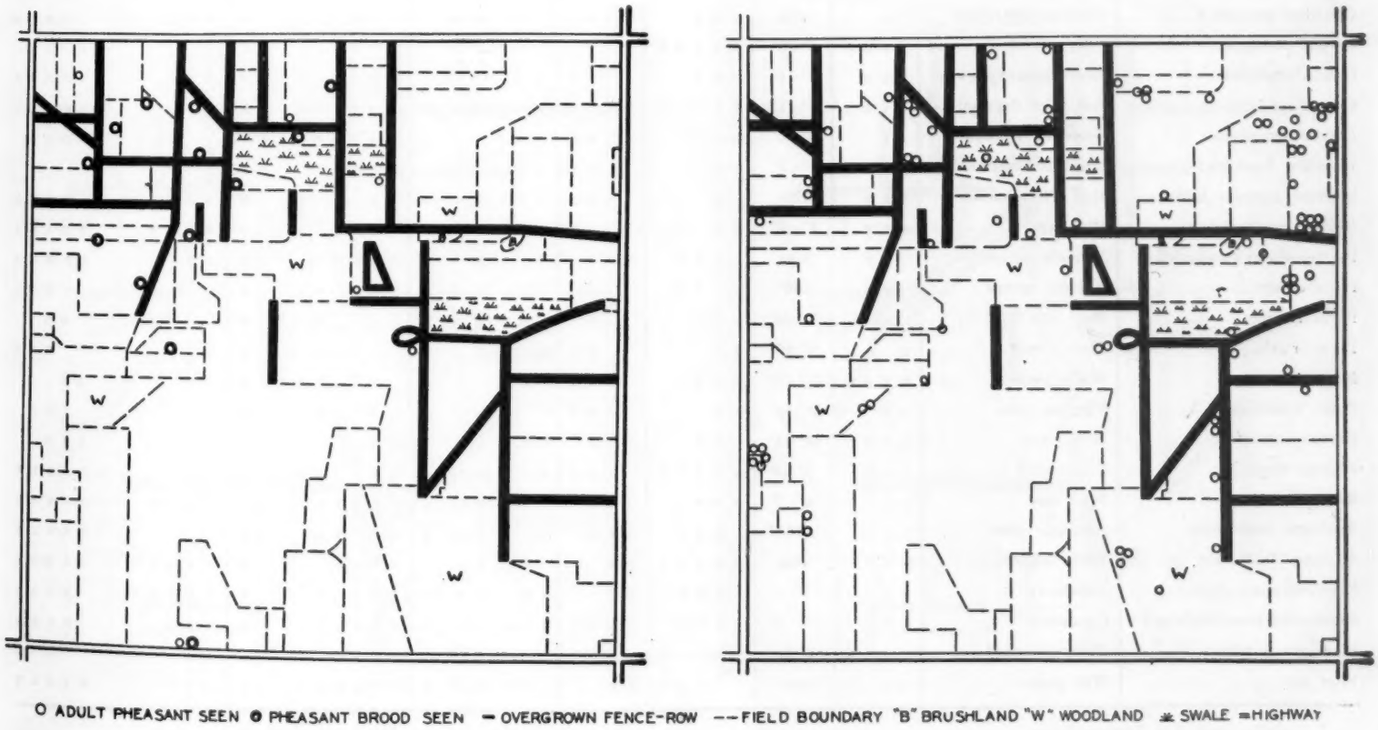
The ratio of the pheasant populations on Area No. 1 to Area No. 2 dropped from 2.5 to 1 in the summer to 1.6 to 1 the following winter, indicating that the carrying capacity ratios of the two areas was about 1.6 to 1. The ratio of shrubby fences was 1.8 to 1 on the corresponding areas. Thus, with other conditions essentially comparable, there was a close relationship between the presence and distribution of overgrown fences and pheasant carrying capacity on this farming land. This relationship is brought out vividly in a graphic representation of pheasant sight record locations plotted on the maps of the areas, on which the positions of cover-forming fences are denoted. During the summer 70 percent of all pheasants seen were in or within 50 feet of such a fence row, the area of which constituted only 8 percent of the total; in winter this proportion dropped to 48 percent. But even more important, the records show that portions of the areas devoid of brushy fences were also practically without pheasants. Whether actually seen within a few feet of such a fence or not, almost all of the pheasants seen and signs observed were in those parts of the areas well serviced with fence-row cover. While winter food is probably the dominant limiting factor of this species in the Northeast, the extent of hedgerows is also of major importance.

Overgrown fences furnish permanent cover lanes to other forms of farm wildlife than the pheasant. Lehmann (1937) says, "Ungrazed strips of native vegetation, 5 to 10 feet wide, ... furnish good lanes of travel for quail. Lanes joining blocks of cover that would otherwise be separated during the winter season increase the acres producing quail and make possible larger and more stable bobwhite populations." Wight (1933) and Grange and McAtee (1934) come to essentially the same conclusion for wildlife in general. Yeatter (1934) particularly emphasizes the importance of shrubby growth in fencerows around hay fields in planning for the encouragement of Hungarian partridges and Summer (1936) gives destruction of fence-row vegetation as "a potent cause of the decrease of (California) quail in modern times." Thus the development of hedges out of inter-field fences, or between unfenced fields, offers the wildlife manager one of the most effective means of increasing the wildlife on farm lands.

Planting for Between-fields Cover

Generally speaking, fences in the Northeast will acquire a woody vegetation naturally if close cropping and cutting are avoided. However, it is often desirable to plant fences artificially to obtain quicker results and insure the desired species composition. This is particularly true of fences that lie on or approximately on the contour and on land that needs soil-erosion control.

In choosing species of woody vegetation for hedge planting, several factors should be considered. Most important of these are:



O ADULT PHEASANT SEEN ● PHEASANT BROOD SEEN — OVERGROWN FENCE-ROW --FIELD BOUNDARY "B" BRUSHLAND "W" WOODLAND ≋ SWALE =HIGHWAY

No. 1. Summer 1933. No. 1. Winter 1934.

(1) Species tolerant of crowding, which form dense thickets and which have soil-holding root systems are desirable. Stoloniferous species are particularly good in this respect.

(2) Species of low height growth, say up to ten feet, are generally preferable to trees. Conifers are an exception.

(3) Species should be included that will furnish wildlife shelter throughout the year.

(4) Species that will assure food for wildlife at all seasons should be given first preference.

(5) Species furnishing fruit and wood products for human use may be included where these are desired.

(6) Species resistant to grazing, but not pasture pests, should be used on fences bordering pastures.

(7) Alternate hosts of crop pests should be avoided. In the northeast these include red cedar, common barberry, gooseberries, currants and buckthorn.

(8) Species poisonous to humans or livestock should be used with caution, or avoided entirely.

(9) Species selectcd should be adapted to existing conditions of soil and moisture, and should be light-tolerant.

(10) Native species are generally preferable to introductions from other regions, or exotics.

(11) The expense of close planting may be obviated by using species that reproduce quickly.

(12) Ideally, at least three types should be planted in each fence-row: thicket-forming hardwood shrubs, vines, and evergreens.

As an aid to wildlife managers of the Soil Conservation Service in the Northeast, the list of woody plants on page has proved most valuable for fence-row plantings. These are given in the form of a chart that indicates also important characteristics of these plants.

This list is not complete for all localities and conditions but rather represents the species that, from the erosion control *and* wildlife standpoint, have proved of most value from West Virginia to Maine.

Field Hedges as a Means of Erosion Control

I have already mentioned that brushy field fences are a means of conserving soil, especially when they run across the slope. A recent (December 12, 1937) radio broadcast of "Farm Flashes," by the Office of Information of the Department of Agriculture, cited a specific case illustrating this point. Referring to a farm in Kansas, it says, "Like many other fields in the vicinity, (the) land was damaged by wind erosion and the blowing soil piled up in drifts along the fence. Last year (the owner) observed that run-off water from his field backed up behind a large fence-row drift.

"This year his wheat yield ran 10 bushels more per acre on that part of the field where water was held by the drift. The fence-row drift had served as a terrace to hold water on his field where it could seep into the soil for plant growth."

This same principle applies to farms in the East, where water

Table 3. UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE—REGION 1. SUMMARIZED DATA ON WOODY PLANTS. Preferred for Fencerow Wildlife Plantings

Scientific Name	Common Name	Moisture Tolerance	Height Growth	Soil Tolerances			Species Using **	Months Available (Fruits, Mast)
				Reaction	Fertility	Texture *		
		Dry Fresh Moist Wet		pH 4-5 pH 5-6 pH 7 pH 7.5 pH 8	High Moderate Low Sterile	Stony Gravelly Sandy Clay Loam Humus	Pheasant Quail Grouse Turkey Deer Rabbit Gray Squirrel Fur Bearers Song Birds	January February March April May June July August September October November December
Celastrus scandens †	Climbing bittersweet	x x	vine	x x x	x x x	x x (x x)	x x x x	x x x x x x x x
Cornus Amomum	Silky cornel	x x x	6'-15'	x x x x x	x x	x x x x	x x x	x x x x
Cornus paniculata	Gray-stemmed dogwood	x x x	3'- 6'	x x x	x x	x x (x x)	x x x x x	x x x x x x
Cornus stolonifera	Red osier dogwood	x x x	6'-15'	x x x x x	x x	x x	x x x x x x	x x x x x x
Corylus americana †	American hazlenut	x x	3'- 6'	x x x	x x	x x	x x x x x x x x	x x x x x
Diervilla Lonicera †	Low bush honeysuckle	x x	1'- 2'	x x	x x	x x	x x x x	
Lonicera japonica halliana	Hall's honeysuckle	x x x	vine	x	x x x	x x x x x x	x x x	x x x x x x
Myrica carolinensis †	Bayberry	x x x	3'- 6'	x x	x x x	x x x x	x x x x x	x x x x x x x
Parthenocissus quinquefolia †	Virginia creeper	x x	vine	x x x	x x	x x x x	x x x x x x x	x x x x x x x
Picea excelsa	Norway spruce	x x	100'	x x	x x	x (x x) x	x x x x	x x
Pinus resinosa	Red pine	x x	70'-80'	x x x	x x	x x (x x)	x x x	x x
Pinus rigida	Pitch pine	x	50'-60'	x x	x x	x x	x x x	x x x
Pinus Strobus	White pine	x x x x	60'-80'	x x x	x x x	x x x	x x x x x	x x
Pinus virginiana †	Virginia pine	x x	30'-40'	x x	x x x	x x	x x x	x x
Prunus americana	Wild plum	x x x	10'-15'	x x	x x	x x x x	x x x	x x x
Prunus virginiana	Chokecherry	x x x	6'-20'	x x x x x	x x x	x x (x x)	x x x x x x	x x x x x x x
Rosa spp. †	Wild rose	x x	1'- 3'	x x x x	x x x	x (x x) x	x x x x x x x	x x x x x x x x
Sambucus canadensis	American elder	x x x	6'-15'	x x x	x x x	x (x x) x	x x x x x x	x x x x x x x
Solanum Dulcamara	Bitter nightshade	x x x	vine	x x x x x	x x	x x x x x	x x x	x x x x x x x
Symphoricarpos albus	Snowberry	x x	3'- 4'	x x x	x x	x x x x	x x x x	x x x x x x x
Symphoricarpos orbiculatus †	Coralberry	x x x	2'- 5'	x x x	x x x	x x x x x	x x x x x	x x x x x x
Viburnum trilobum	Highbush cranberry	x x x	6'-15'	x x x x	x x	(x x) x	x x	x x x x x x x
Vitis spp.	Wild grape	x x	vine	x x x	x x	x x (x x) x	x x x x x x x	x x x x x x x

* (xx) Combined Soil Texture Type.
** x Indicates Species Furnishes Staple Food for Species Using.
(N. b. Region I. includes all states from Me. to W. Va.)
† Indicates Resistance to Grazing.

erosion is the main cause of soil losses. Cross-slope fences that are overgrown serve as barriers to both sheet and gully erosion and tend to form a terrace, which improves soil moisture conditions. In numerous cases there has been observed a three to eight foot difference in ground level above and below the fence, largely owing to the building up of washed soil on the upper side of the fence.

The soil-conserving values of hedge fences have a direct bearing on wildlife since, like any other crop, it is basically dependent upon the soil. But the important aspect of the fence-row soil relationship to the wildlife manager is that a sound program of farm wildlife management can be sold on a multiple-purpose basis. The direct agricultural benefits accruing from overgrown fences are more readily appreciated by the farmer than is the wildlife value alone. The encouragement of between-field permanent cover should be sold on its complete multiple-value basis.

The Farm Fence as a Means of Protecting Existing Habitat

We have so far considered the farm fence as a means of obtaining permanent cover for wildlife on open lands and of improving soil conditions for farm crops. We may add that it also protects woodlands, swales, swamps and water areas from livestock grazing. The effect of grazing on these types of wildlife habitat is too well known to need elaboration here. Too often, grazing renders uninhabitable to many species an area with great wildlife potentialities.

It should be noted that, contrary to the relation of open-land fences to wildlife, the value of the fence in protecting woodland coverts tends to increase with the less fertile and poorer farm lands. Here again, the arguments against the practice of grazing there inferior pastures are not confined to the advantages of encouraging farm wildlife. A sustained yield of woods products demands that woodland reproduction be protected. Proper conservation of farm soils and water is impossible without protected permanent vegetation in all woodlands, gullies, swamp and marsh areas. The wildlife program must be constructed on this multiple-purpose foundation if it is to be practical and successful, and the use of the fence as a tool of the conservationist should be given greater attention than ever before.

Summary

1. Farm lands generally lack adequate permanent wildlife shelter.
2. Fence-row vegetation offers one very good opportunity for improvement.
3. Systems of overgrown fence-rows will raise the wildlife carrying capacity of the farm markedly.
4. Artificial planting of fence-rows insure good species composition and provides quicker results.
5. Overgrown fences benefit crops, aid in soil and water conservation and improve landscape values.
6. Fencing is valuable in protecting grazed woodlands, brushlands and swamps from erosion and water losses and in providing wildlife habitat and a sustained yield of wood products.

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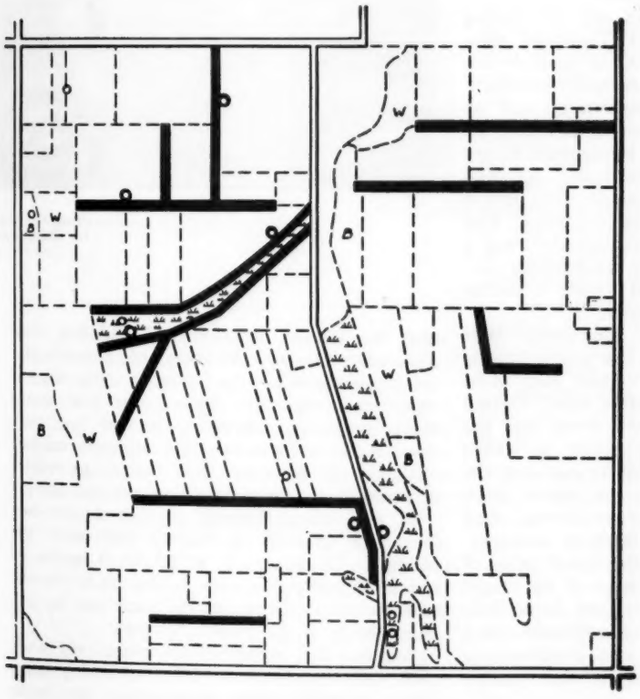
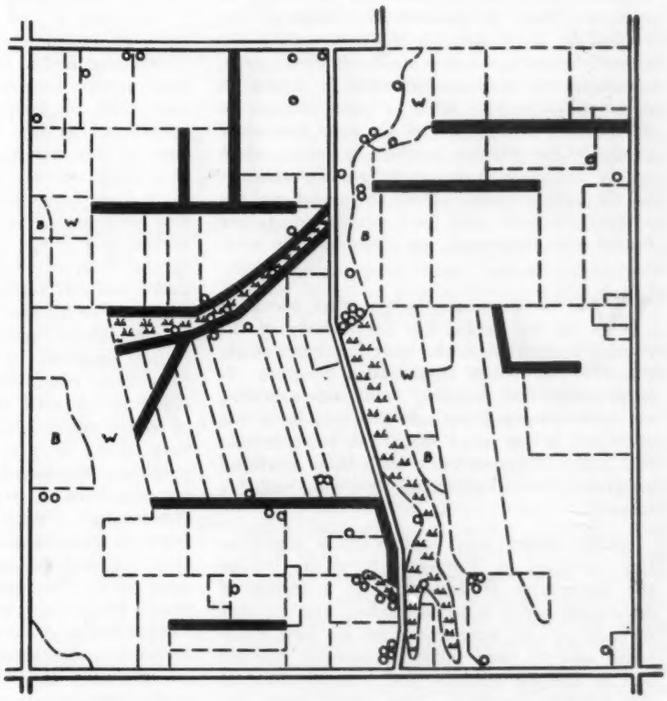




O ADULT PHEASANT SEEN ● PHEASANT BROOD SEEN = OVERGROWN FENCE-ROW -- FIELD BOUNDARY "B" BRUSHLAND "W" WOODLAND ⩙ SWALE =HIGHWAY

No. 2. Summer 1933. No. 2. Winter 1934.

TAKING CONSERVATION

By John C.

Address—International Conference of Game, Fish and Conservation Commissioners Asheville, N. C., June 21st, 1938

Tennessee School Exhibit.

Students studyi
in their own

EDITOR'S NOTE: *Tennessee has formulated a model program of conservation education, particularly in the schools. Pennsylvania tried a similar plan several years ago but obvious lack of interest on the part of various agencies combined to defeat it. Now we are happy to announce that an educational committee appointed by the Federation of Sportsmen's Clubs is working out a program similar to Tennessee's, which if approved will institute a course in conservation in the public schools; second, in all teacher's colleges, and at the same time make available for present teachers material which can be applied both theoretically and practically in the school room. Many organizations, including patriotic, civic and service groups are behind the movement one hundred per cent.*

WE in Tennessee believe that education of the public, and particularly of the coming generation, is the most important single phase of our entire conservation program. It is possible, that learning from our mistakes, we have developed methods that may be of use to others in the same work and I am certain that many of you in your work have developed programs from which we may get some valuable ideas.

About fifteen years ago various conservation agencies in Tennessee began to realize the importance of education as a means of developing conservation attitudes. The forestry division of our state instructed its men many years ago to visit schools whenever possible and to interest teachers and students alike in the forestry program. This early work developed and bore fruit so that in 1926 pressure was brought to bear on the legislature and a course in forestry and conservation was set up by law with a legally adopted textbook. Still later the educational trend had its effects in game and fish work and in 1935 the State Game and Fish Commission inaugurated a Division of Education to start work throughout the state among the schools.

Less than a year and half ago all existing agencies in conservation in Tennessee were coordinated and a Department of Conservation was formed. One of the important administrative units of this new Department was an educational section. It became immediately the duty of this section of the Department to try to coordinate all the educational activities carried on heretofore and mould them into a new program of conservation education. One of the first things that was attempted was a careful study of all the prior conservation education work in Tennessee and a study of similar programs of all the other states.

Immediately some very interesting facts became apparent. We soon saw that relatively little true educational work had been done either in our state or any other state. Instead of conservation *education*, the work that has been done to date might better be called publicity. We found, too, that in our state the teachers were not trained in any way to teach conservation. With few exceptions, they knew nothing of the importance of conservation and had no idea of the possibilities of teaching it. We found that most of the school work which had been done had been done independently of regularly constituted school authorities by individuals who happened to be interested and was generally more nature study than conservation.

Conservation had been taught, it is true, in compliance with Tennessee law with an adopted textbook for ten years but we found that this forced teaching had had but little beneficial results. A study of conservation education carried on by the other states showed these same failings. Some very few states have adopted conservation courses but they have made no provisions for adequate teacher training. It is worse than useless to expect a teacher, who knows nothing about conservation and whose interest in the subject has not been aroused, to successfully teach the subject. Obviously, it would be a waste of teachers' and pupils' time to require a teacher, who couldn't add or subtract and saw no importance in it, to teach arithmetic.

We feel that nearly all the educational work that has been done to date is nothing more than publicity and propaganda, or feeble nature study programs of the "see-the-pretty-birdy-type". It is our sincere opinion that conservation education is a term that takes

INTO THE SCHOOLS

Caldwell

Educational Assistant
Tennessee Department
of Conservation

Forestry and Land use Exhibits used by the Tennessee Conservation Education Service.

forestry and wildlife acre forest.

in a lot more than the making of many speeches and the sending out of many news reports. It is a lot more than telling people about the fish hatcheries and the game farms —about the importance of buying one's license. Conservation is the proper use of our environment and thus conservation education must teach this proper use and show the results of misuse.

With these facts in mind, some 15 months ago we started what we feel is a program of real conservation education. The first and most important project we have undertaken is to see that conservation is properly taught in the schools of Tennessee under the supervision of proper teaching authorities. We realized at once that teachers themselves must be trained and awakened before they can themselves teach conservation. In Tennessee, county teachers' associations meet once a month during the school year, generally on Saturday, for educational programs. We first contacted the county superintendents of education in the 95 counties of the state, asking them to allow a department representative to meet at one or more of their institutes during the year and explain our conservation program and discuss with the teachers, ideas relative to teaching conservation.

During the last year we met with 37 such groups, contacting some 6,000 teachers telling them about the conservation program of Tennessee and our desire to get proper conservation teaching in the schools. Immediately following each teacher's meeting, conservation department representatives visited in that same county, putting on programs at some five or ten schools in the county. In this way teachers obtain some little mass training but quite naturally we cannot expect to do much in one or two hours during the year. However, we consider this early contact of the greatest value in making our subsequent reception a favorable one.

Our second method of training teachers in the teaching of conservation is to obtain the introduction of such courses in seven of the leading colleges and universities of the state. Teachers must study conservation if they are to teach it. Certainly an English teacher is not put into a school unless she has studied English. We have met with the professors selected to teach the courses and have helped them plan their work and have had department personnel meet with each class several times during the course and we attempt to supply them with factual material. We have a surprisingly heavy enrollment in these courses during this first year and the professors report widespread interest in conservation.

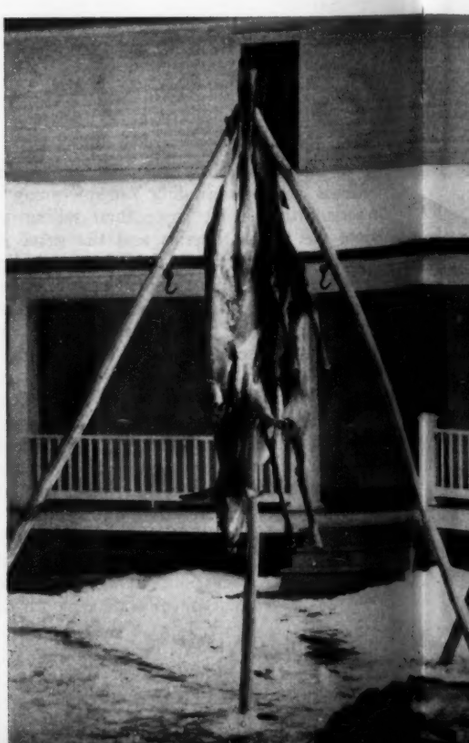
Next after training the teachers of the state, we realize that the general public—father, mother, members of the school board, etc.—must be sold on our conservation program if we are going to get successful teaching of conservation. With this in mind, we have traveled the state systematically from county to county, visiting schools, colleges, school board meetings, meetings of every variety—teaching the people the importance of conservation and telling of our efforts to obtain its teaching. After all, it is the "patrons"—the people that send their children to school—who really run the school. In many cases curriculum content is investigated by these patrons. If conservation is to be taught, these people must be behind it and pushing it.

Some months ago a twenty-foot trailer was bought and outfitted as a traveling conservation exhibit. The trailer is equipped with exhibits covering all phases of conservation—forestry products, minerals, stuffed birds, and animal skins, charts, maps, graphs; it also contains excellent motion picture equipment and a powerful generator so that we can show motion pictures in any school no matter how far from electricity it may be situated. Since October, when this program started, we have scheduled some 340 meetings in nearly every county of the state. This figure may sound big but much more impressive is the fact that during the same period it was necessary to turn down 1200 invitations for conservation speakers. That would certainly indicate the interest in this important subject.

(Continued on Page 28)

Top: A 298 pounder shot in Pike c
Pennsburg. Left to right—Henry Ger
Coopersburg; Maurice May, Milford; H
Haring and Hiram Wisner, all of Pennsbu

The other photos depict what the
his way here and there throughout the
viewed many farmers all of whom were
less deer season. He was told by many
—that the animals had become so
serious and frequent that they were
farms. Some had killed as many as fift
and early fall to try to stem the tide o
us hope the season will have afforded



hot in Pike county by Foster C. Hillegas, of
–Henry Genszler, Red Hill; Edgar Knerr,
, Milford; Hillegas; and Henry Kurz, H. H.
ll of Pennsburg.

ct what the cameraman saw as he wended
ughout the State. In his travels he inter-
whom were loud in their praise of the antler-
old by many that it was their only salvation
become so numerous and depredations so
they were thinking of abandoning their
many as fifty deer during the late summer
n the tide of invasion but to no avail. Let
ve afforded them some relief.

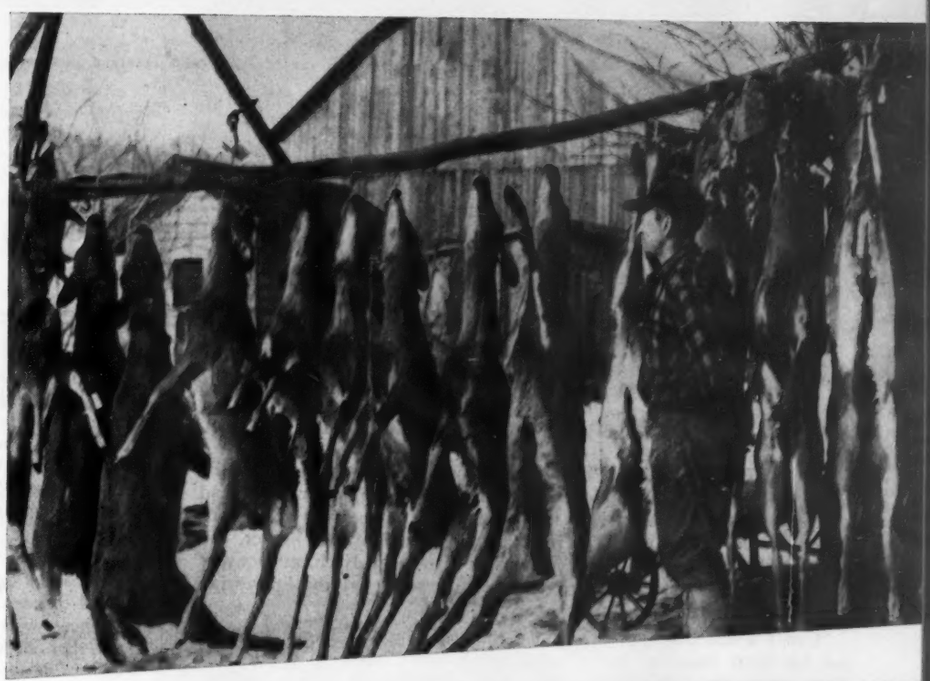


Photo Academy of Sciences

A total of 26,000 pupils from the Philadelphia public schools visited the Museum and received instruction from the Department of Education during 1937-38.

How A Museum Serves Conservation

By W. STEPHEN THOMAS
Director of Education
Philadelphia Academy of Sciences

The Value of any Museum can be increased by the establishment of an Educational Service.

A GROUP of eager boys and girls crowded around a table in the Museum of Philadelphia's Academy of Natural Sciences. Spread out before them was a varied assortment of the fur-bearing animals of Pennsylvania. Here was the tiny mole, the paddle-tailed beaver, the fox with his sly expression and a number of others. Each, attractively mounted in the most life-like of postures, scarcely gave the impression of being dead creatures.

"Can I touch the squirrel?" a ten-year old boy asked timidly as he put his hand near the bushy tailed animal. He has seen pictures of them many times before but only had he glimpsed a live squirrel scampering along the lawn of a city park. He had long wanted to hold one in his hands.

"Certainly you may touch him. That's why we have him here," replied the young lady museum teacher. "And now see whether you can make a discovery. How does he open that beech-nut he is holding?"

"Oh, I know. He cracks it!" triumphantly shouted a small chap with glasses who appeared to be sure of his information. Quickly, a blonde-haired girl, who had been quietly watching up to this point, broke into the conversation.

"No, he doesn't. Can't you see the marks of his teeth on the shell? He nibbles the nut."

"Yes, you are practically right. He gnaws or nibbles the shell. Squirrels would have a hard time cracking such a tough object. But not many people would realize that. And now that we are talking about squirrels, do you know that there are other kinds besides the gray?"

"Oh, yes, the red," was a little girl's retort.

"Well, there are others, too. We can see them at the Game Exhibit.

"What's that?" said a boy.

"Let's go and see," replied the teacher. A few minutes later the visitors to the museum trooped down a corridor and assembled before a row of glass-fronted cases. Within these cases the class observed groups of birds and animals mounted in natural settings of forest, upland and marsh. Here they recognized the trim black and gray of the Canadian geese, the strutting wild turkey gobbler, his fan-like tail spread widely, the bright-coated fox and the diminutive cotton-tail rabbit, who blended so perfectly with the dry leaves on which he crouched that he could scarcely be seen. The boys and girls peered with excitement at the longtoed rails, seeking their food among the protecting cat-tails and the tiny sandpipers, stopping in their run along the water's edge. These were less familiar and even unknown to most of the class.

From a label, prominently displayed, the youngsters learned that this was an exhibit of Pennsylvania's wild game. Here, also, were printed explanations of the game laws of the State. It surprised them that there were so many different kinds of creatures. The teacher told them that conservation meant the wise use and management of our wildlife, as well as of forests, soil and waters. They found a collection of birds that it was prohibited to hunt. These included the dainty little sandpipers, the brightly plumaged wood ducks and others. Some are so rare they might be exterminated if they were hunted. But they learned, also, that a certain amount of hunting was beneficial to prevent certain kinds of animals and birds from overcrowding others. Among the group of game animals they found their friend, the gray squirrel, realistically clinging head downwards on a tree trunk as if he were about to scurry away at their approach. Near him were the other squirrels, the red, fox and black, which were new to them. The teacher pointed out that this exhibit they were admiring had been built by the Academy of Natural Sciences with the help of the Game Commission and that their class was among the 70,000 school children and 280,000 grown-ups who had seen these animals since the exhibit had been opened in 1936.

The School delegation whose course we have followed is representative of the hundreds that visit the Academy in Philadelphia each year and take advantage of its free educational service. And these classes from schools, both public and private, come not only from Philadelphia and its suburbs but from towns and cities scattered all over Pennsylvania. Many of these even journey from the neighboring states of New Jersey, Delaware and Maryland, often travelling long distances by bus. During the past year, alone, some 38,000 young people from kindergarten to college age were members of the groups which studied natural history in the museum. These lessons in which they joined covered many different nature topics. The subjects ranged from the story of "How Life Began", millions of years ago to an intensive study of the plants, birds, animals, and even the rock formations in the talk, "Our Changing Earth." Then, also, there were

lectures on the adaptations and relationships of living things, the change of the seasons and the habits of animals.

A lesson which reveals the trend of interest in the preservation of our natural resources and of our wildlife is the Museum Talk, "Our Rich Land", offered by the Academy for the first time this fall. The story interprets to children the fascinating story of conservation. It traces the ways in which the country's wildlife has been menaced, its forests cut down, its top-soil washed away, its streams and rivers polluted and its mineral resources wasted. But it shows as well the many hopeful ways in which the natural wealth of the United States may be conserved by pointing out the advantages of the game laws, game refuges, re-stocking of animals and the winter feeding of game. It stresses the benefits of forest fire prevention, the fighting of soil erosion, the use of dams and the wise drainage of swamps. Boys and girls learn the possibilities of helping in these beneficial services. Through interesting photographs and a series of colored motion pictures, provided by the Pennsylvania Game Commission, the conservation movement becomes dramatic and alive. At the close of the lesson, teachers receive literature and posters describing winter feeding of birds and animals and other ways in which her pupils may help in maintaining the balance of wildlife.

In short, such Museum Talks or lessons are combinations of lecture and demonstration which makes very real the study of books. Before the teacher brings her class for the visit she receives an outline of the subject, which helps her to prepare her group for the lessons they will experience. At the museum, the meeting is conducted informally with thought for the age and interests of the children. There is plenty of chance for discussion, for every child is invited to ask questions and to draw others from his class-mates. Following the lecture, the class proceeds to the museum galleries where the young people observe an extensive series of models, mounted specimens, and those fascinating arrangements of animals and plants, called "habitat" groups, in which the objects are set up realistically in their natural surroundings with beautifully painted backgrounds.

By means of intimate experiences such as these, thousands of boys and girls, for the first time in their lives, have close contact with birds, animals and plants and the whole array of nature. They learn what can be found at their own back-doors, as well as in foreign lands, reached by the far-flung expeditions which the Academy has sent to distant corners of the earth. And to all parents and to sportsmen who realize the importance of a knowledge of nature and a nature awareness, this movement of children toward the museum is significant.

For the museum pilgrimage is now an established part of the work of the schools which today recognize two broad objectives. First, they see that learning from books alone is by no means sufficient. No spoken explanation or written description can equal a view of an

(Continued on Page 28)

Photo by Spencer B. Fulweiler.

Photo by Spencer B. Fulweiler.

Top: Thousands of school children use the Conservation Exhibit.

Center: Work on a group project illustrating the principles of Conservation.

Bottom: A class of crippled children in the museum enjoy studying one of Pennsylvania's fur-bearers.

Photo courtesy Philadelphia Enquire.

RINGNECK

By ROBERT OSBORNE STEELE

RINGNECK strutted across the road and swiftly and silently lost himself in the field of timothy. He cocked his head to one side and gurgled softly to himself. It was September and the blood rushing through his veins was quickly imparting a multi-colored hue to his present muddy colored feathers. He frequently cackled aloud just to see how it sounded and then listened expectantly for some answering call. At times Ringneck came upon others of his brood. They had been born and raised in that patch of farmland and until a month ago had chased grasshoppers together. Maturity had gradually separated them until now Ringneck ran and nested alone.

As he proceeded through the field he paused now and then to scratch for a bit of roughage or scrutinize a clump of weeds for particular kind of seed. Life was bountiful and pleasant, for Ringneck had not experienced a hard winter nor the terrors of a hounding gunning season.

Even at the age of puberty his inherited knack of self-preservation was fast becoming apparent. A shadow moving across the field frightened him into an indiscernible statue or caused him to run swiftly for the protection of a fallen tree. He quickly learned to differentiate between natural and artificial sounds. The usual sounds he ignored but the unusual was a signal to crouch or quickly circle so that the sound was moving away rather than toward him. He often met Jim who farmed that land and in youthful exuberance he would run around and settle quietly behind him. He supposed that Jim never saw him but in that he was mistaken for Jim marked the spot and purposely crossed the field at that point to watch his maneuvers.

Ringneck seldom flew unless he wanted to return to his family which bedded down near the corn field. When de did he cackled loudly and then enjoyed the surprise and consternation his approach created. He joined his family less frequently since the time the dogs had stumbled on them and successfully scattered the whole flock. It was an experience, but after it was over he knew that he could easily evade a dog by flying.

He preferred a solitary existence, however, and soon got in the habit of nesting down near the corner of the field which joined the woods. It was convenient and quiet. Quiet with one exception. Every night when Jim came home from the fields he passed that way and every time he did so Ringneck had to move. Sometimes he flew, particularly if that batty lemon and white setter was along and started to nose about. If Jim was alone he simply moved to one side and waited. After Jim passed he returned to his favorite spot. They got to know each other.

When Jim first drew near Ringneck could feel his tread on the ground. He listened carefully. If there was no dog he waited for Jim's cackle. It was absurd for Jim to try to imitate a bird but Ringneck always helped the game along by cackling in return. Often they cackled to each other twice just for the fun of it.

"You still live there do you?" Jim would ask softly.

But Ringneck only would look wise, cock his head to one side and never answer.

If the setter was along it was more exciting. Both Jim and the dog approached cautiously and Ringneck would hear Jim talking quietly as if he was trying to teach that dog some bird sense. Ringneck would crouch low and wait. First, of course, he looked around for the clear spot to get up. He had to avoid heavy brush or briars. A few seconds delay might be fatal.

"Easy, boy, easy," Jim would whisper and Ringneck knew the dog was near.

"Steady, old fellow," and peering through the grass Ringneck would see the dog watching with steady eyes, his head thrust forward, his front foot raised. He often wondered why the dog didn't come closer, he could give him another three feet and beat him to the jump. Just about that time Jim came ploughing through and it was time to go and go high. Jim always cackled at that movement and Ringneck answered as he rose.

Often Ringneck looked down as he flushed and when he did he would see Jim raise his arms and squint along his fingers. Funny business, he thought, but since nothing ever came of it he quickly forgot. The hunting and flushing soon became a daily routine procedure. It went on for sometime and the morning air grew crisp and at night a slight frost painted the grass white. Ringneck grew heavy and strong and his feathers gradually took on the colors of the rainbow.

One morning he awoke with strange forebodings. The world was very quiet but there was a tenseness in the air which he could not comprehend nor understand and it worried him. As was his usual custom he wandered from his nesting place over to the adjoining farm. Through the corn field to a fence line. Here was food, succulent and in plenty. The sun came up in a blaze of fire and Ringneck shook himself as the warm rays penetrated his feathered coat. He became aware of strange moving figures in the distance but quickly dismissed them as being things apart from his own personal world. He scratched and hunted and otherwise enjoyed himself.

Suddenly, however, he brought up sharply and crouched warily as he heard a man call far down the field.

"Too bad, old boy. Better luck next time," he heard, and he watched carefully as a female relative flew high overhead and coasted out of vision.

It was the same kind of voice but it was not Jim's. These were strangers in his land. It would be well to be careful.

While Ringneck meditated flight he was conscious of a running dog in the vicinity. It apparently was running across the field, back and forth, for at times he could hear it distinctly and then the sound would fade away. Here it was coming again but this time it was different. The dog had stopped. It was approaching him and Ringneck crouched. The same game he and Jim played, he thought, and he looked around for the clear spot to fly.

"He's on point," he heard in the distance and looking through the grass Ringneck could see a big, bony, liver and white animal with floppy ears and a set square jaw. Its sensitive nose quivered as Ringneck returned the stare.

The dog was a stranger and Ringneck decided to leave while there was yet time. Maybe the dog wouldn't understand. It might jump and try to grab him. He rose in one royal swoop, beating his wings frantically to get altitude and swerved to the left for that long glide down the valley. As he turned he look down at the men. There were two of them and they were both going through the motions Jim had used. Their arms were out and their heads down as they squinted along their fingers only this time he noticed a long black stick in each man's hand. He cackled a greeting but even as he spoke the black things answered. First one and then the other.

Ringneck felt the air churn around him at the first shot, on the second he felt a biting sting in his left side. He dipped slightly but having gained sufficient height he now merely set his wings and soared. Fear and the burn in his side made him determined to place as much distance as possible between himself and the men. He glided over the tree tops of the valley and over the next rounded knoll. Finally he settled down in a little used corner of a field where the grass was uncut. He found a small open spot where he could press his sore side against the cool earth and there he remained.

It was days before Ringneck was himself again. The wound had burned and blistered but by stretching his neck he had been able to extract the pellet and soon the stiffness in his side left him. The experience of being shot at, however, was something he never forgot.

During the time that Ringneck nursed his punctured side he heard much foreign activity. Guns were booming and the barking of dogs was heard frequently. As the days wore on this tumult subsided somewhat but the occasional shot or bark always found him alert and prepared to move instantly.

The little corner of the field that Ringneck used was not invaded by gunners and from that angle was ideal but Ringneck yearned for his old nesting place. It was just back over the knoll and on the other side of the valley. Gradually he retraced his flight until two weeks later he finally arrived in familiar surroundings. He cackled softly to himself as he tried out one nesting place after another. He noticed at once that shots were less frequent here than in the cover he had used for the past two weeks. In fact he heard only a few shots a day and they were so far away he gradually lost interest in them.

It was about a week later that Ringneck suddenly sat bolt upright and sharply cocked

RINGNECK

his head to one side. He heard a soft whistle in the distance and the dull thud of charging feet. He recalled vividly his past experience and took immediate steps to protect himself. He would trust no man, not even Jim with his playful cackle which was supposed to sound so real and pheasant-like.

"Funny where that bird got to," he heard in the distance. The panting of the dog came to him now and was the signal to move and move fast. He parted the high grass silently and slipped off toward the woods propelled by fear and consternation. By the time he got to the underbrush which fringed the field he could hear the dog slow up.

"Hold it, old boy," Jim whispered softly to the dog. "That's a wise bird you're playing with. Careful."

Ringneck didn't want to hear the finish of the monologue. He moved noiselessly over the carpet of dried leaves, crossed a small open patch and dipped down into the bed of a small stream. Up this he ran as far as possible. He turned off sharply to the right through the woods and out in the clear. As he took off he cackled loudly as a matter of habit and in the distance he heard Jim laugh and cackle in return.

It was several days before Ringneck returned. He didn't know it, of course, but it was the last day of the season. The hills and fields were silent except for an occasional shot. The day passed slowly and finally the sun began to settle in the West and the tree and grass and even the bare ground was colored with a golden reflection.

Ringneck sat dozing in his accustomed spot. It was warm, even sultry. Occasionally he preened a feather or searched for a minute marauder in his brilliant plumage.

Subconsciously he heard walking in the distance but it was the casual step of some one strolling and not the fareful tread of a person hunting. He closed his eyes again and dreamed on. Soon the steps grew louder.

"To think that cock bird out-smarted us," Ringneck heard Jim remark to his dog.

Jim's gun was slung loosely under his arm. His hat was pushed back on his head and he had the contented feeling of one who had finished a successful season. Of course, he would like to have added Ringneck to his bag but he was one who enjoyed the competition in gunning. If a bird was clever enough to make a getaway, God bless him and save him for another season. If Jim missed a shot he swore to himself and gave credit to the bird for ducking out of range. He blamed his own inaccuracy if he missed. In that spirit Jim approached the corner of the field at the end of the day.

The setter strolled contentedly at his side. Occasionally he sniffed the air lazily but it was a half-hearted gesture given at the end of the day through habit rather than with expectancy.

"And to think he out-smarted you, Cap. That's the sad, sad part of the story," Jim mumbled on and Cap turned his head and drooped his ears in shame.

Suddenly the dog stopped, raised his head sharply and stiffened his tail.

"Don't tell me the old rascal is bedded down in his old place?" Jim exclaimed. "Take it easy, old fellow. Slow and easy."

Cap moved ahead cautiously and Jim moved his gun into position. If Ringneck rose he would undoubtedly head for the woods. It was close and sure cover. The best possible position was between the dog and the cover. If he missed the shot coming up he could take another as he flew over. Jim thought this all out carefully as he slipped his safety. The last shot of the year. The last contest of the season. Let the better man win.

Ringneck watched through the grass cautiously. He decided not to run, perhaps Jim and his dog might pass him by. He heard the dog draw closer, the dog stepping high and carefully hardly moved a blade of grass until his keen eyes peered back at Ringneck. He heard Jim move to one side.

All nature held its breath. The dog moved slightly nearer and quivered in anticipation. Ringneck crouched lower for the spring and then it came. Up he soared and straight toward Jim. As he rose he looked down at Jim standing waist high in the grass. He saw Jim level off with his arms, but to his consternation he saw grasped in Jim's hand one of those long black sticks.

Ringneck cackled a protest. This wasn't part of their game. He crackled again.

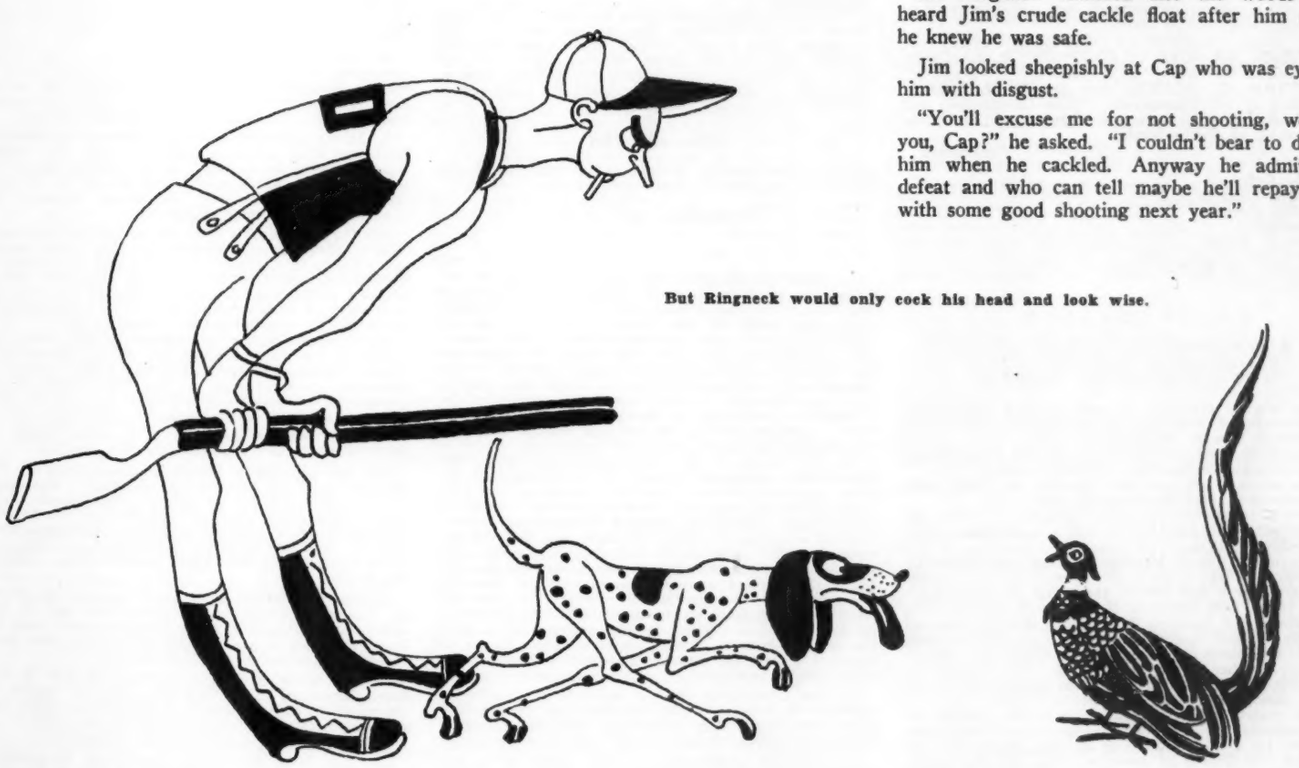
Jim squinted along the double barrel. He swung it carefully along the line of flight. A foot lead at that point was just about right and his hand slowly started to contract. Then he heard Ringneck cackle in protest.

He hesitated a second and a broad grin spread over his face as he lowered his gun.

As Ringneck vanished into the woods he heard Jim's crude cackle float after him and he knew he was safe.

Jim looked sheepishly at Cap who was eying him with disgust.

"You'll excuse me for not shooting, won't you, Cap?" he asked. "I couldn't bear to drop him when he cackled. Anyway he admitted defeat and who can tell maybe he'll repay us with some good shooting next year."



But Ringneck would only cock his head and look wise.

COURT UPHOLDS COMMISSION'S REGULATORY POWERS

Decision Establishes New Principles in Pennsylvania Legal Procedure

THE decision of the Dauphin County Court in the 1938 Pennsylvania Antlerless Deer Case (Court of Common Pleas of Dauphin County, Equity Docket No. 1446, Commonwealth Docket 1938, No. 773) not only sustains the Pennsylvania Game Commission's regulatory authority, but establishes new principles in the adjudication of such cases in the Commonwealth of Pennsylvania.

Attorneys for the plaintiffs held that (1) the action of the Commission in declaring an open season for antlerless deer was not supported by sufficient facts; (2) that its action constituted an unlawful delegation of legislative power in contravention of the Constitution of Pennsylvania; and (3) that under the law the Commission was compelled to specify size, weight, and age.

The attorneys for the Commission, Hon. Guy K. Bard, Attorney General, Oliver C. Cohen, Assistant Attorney General, and John H. Fertig, Special Counsel, contended (1) that the plaintiffs in this case had no legal standing to inquire into the reasonableness of the rules and regulations promulgated by the Commission because their private rights, their contractural rights, and their property were not involved; (2) that they were questioning powers of governmental management; (3) that such rules and regulations do not delegate legislative power; (4) that the rules and regulations removing protection from and providing an open antlerless deer season were reasonable and proper; (5) that the Game Commission has power to confine the deer herd to the deer range and not to permit it to roam on farmlands and highways; (6) that in removing protection from and declaring an open season for antlerless deer the Commission is not required to fix a specified weight or age of the animals to be taken; (7) that when an open season is fixed for deer without visible antlers the Commission is not required to limit the number of hunters by issuing special permits; and (8) that the plaintiffs were barred from bringing action because they delayed the proceeding unnecessarily. These contentions were supported by numerous citations from court cases in other states.

Attorneys John Q. Creveling, of Wilkes-Barre, and John C. Youngman, of Williamsport, presented a brief in behalf of the Pennsylvania Federation of Sportsmen's Clubs, in which they held that the plaintiffs were guilty of needless delay; that the administration of the game of Pennsylvania is a scientific management problem; that no problem of delegation of legislative power was involved, and if so, it was not an unlawful one; and that the Commission's action was not an abuse of discretion.

The opinion of the Court, published in full below, is self-explanatory. It not only upholds the regulatory powers of the Game Commission and the action it took, but establishes a new principle in Pennsylvania legal jurisprudence; namely, that an agency such as the Pennsylvania Game Commission, when managing public property, is not subject to the same restrictions and limitations as a public agency dealing with situations where private rights are involved.

The decision of the Dauphin County Court in this case will have a far-reaching effect, not only in Pennsylvania but in other states where regulatory responsibility is placed upon game and fish administrative agencies.

OPINION OF THE DAUPHIN COUNTY COURT 1938 PENNSYLVANIA ANTLERLESS DEER CASE

(Rendered November 18, 1938)

STEWART A. LEHMAN, SAMUEL E. HOFFMAN, E. G. GRASER, FLOYD KEASEY, F. MARK BREAM, CLYDE L. BREAM, H. A. WAGNER, and M. A. NIEDENTOHL,

Plaintiffs,

V.

LT. COL. NICHOLAS BIDDLE, ROSS L. LEFFLER, SAMUEL C. CASTNER, R. LAMBERTON, A. W. LEE, Jr., FRANK B. FOSTER, WILLIAM G. FLUKE, and JOHN H. PRICE, members of the Pennsylvania Game Commission; and GUY K. BARD, Attorney General of the Commonwealth of Pennsylvania,

Defendants.

In the Court of
Common Pleas of
Dauphin County,
Pennsylvania
Sitting in Equity
Equity Docket No. 1446
Commonwealth Docket 1938
No. 773

ADJUDICATION

A STATEMENT OF THE PLEADINGS SPECIFICALLY SETTING FORTH THE ISSUES RAISED THEREBY.

The original plaintiffs, as well as those intervening, are citizens of Pennsylvania, taxpayers, and holders of hunting licenses for the year 1938.

The defendants are members of the Pennsylvania Game Commission and the Attorney General.

The original bill was filed October 24, 1938, with an amendment filed November 9, 1938.

Answer to the bill was filed November 1, 1938, and supplemental answer to plaintiff's amendment filed November 10, 1938.

The issues raised by the pleadings are primarily questions of law.

Hearing was had before the court in banc, testimony taken, with argument November 10 and 11, 1938.

Learned and complete briefs were filed by counsel for the parties, and also on behalf of the Pennsylvania Federation of Sportsmens Clubs as amicus curiae, together with illuminating oral arguments.

It was the understanding that the hearing before the court should be a final hearing.

The controversy submitted is as to the validity of the resolution of the Pennsylvania Game Commission of July 13, 1938, establishing an open season for the hunting and killing of antlerless deer for the period of six days from November 28 to December 3, 1938; particularly as applied to the counties of York, Adams, Cumberland and Franklin, comprising what is called the South Mountain area.

It is further alleged by the plaintiffs that the resolution of the Commission and its action in accordance therewith is unreasonable, arbitrary, and an abuse of its discretion; and that the provisions of section 501 of the Pennsylvania Game law of 1937, under which the Commission purports to act, is an unlawful delegation of legislative power in contravention of article 2, section 1, of the constitution of Pennsylvania.

Plaintiffs further assert that the fixing of an open season for all antlerless deer without minimum age or weight, open to all licensed hunters and covering all the counties and areas without regard to the number of deer in each, violates the express requirements of the game laws and extends the powers over and upon the Game Commission.

THE ANSWER

traverses the material allegations of fact and denies the legal assertions of the bill.

FINDINGS OF FACT

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1. Prior to adopting the Commission's rules and regulations of July 13, 1938, which include provisions regarding deer and other game, a careful statewide study was made by the Game Commission and its officers, agents and representatives, with special reference to the deer herd; the result of which was laid before the Commission and a joint meeting of the directors of the organized Sportsmen of Pennsylvania in May, 1938, all of which was given study by the Commission, resulting in the resolution of July 13 when it adopted findings of fact and resolutions fixing the seasons, bag limits, etc.

As the result of the investigation and study the Commission among its findings of fact found that the deer herd has become entirely too large for the available forage supplies to sustain it in such condition that it may normally be expected to propagate its own kind in a biologically sound manner; also that the sex ratio is badly unbalanced and should be corrected, necessitating a reduction in the size of the herd through the declaration of an open season of six days on anterless deer this year, with no open season for anterlered male deer; and to accomplish these objectives hunters should be allowed to take antlerless deer with the regular hunting license wherever such license is required without the issuance of special control permits as authorized by section 501 of the game laws.

2. The Commission did not separate the particular counties of Adams, York, Franklin and Cumberland from the others, but took them into consideration along with the counties through the state generally.

3. There is a shortage of food except in a few limited spots in the true deer range in the four counties in question, as well as in the rest of the Commonwealth.

4. The nature of deer and their natural food supply at this time requires the action of the Commission complained of in order to carry out the declared purposes of the Commonwealth to protect, propagate, manage, and preserve the game.

5. On the four counties of the South Mountain belt there is too little food supply for the deer roaming from time to time in that region.

The conditions are not as bad in that section as in other areas; and there are counties where the deer population per square mile of deer territory is more dense.

6. The purpose of the Commission in the action complained of is to so regulate the deer herd that it will be maintained in its best condition, and at the same time so that the deer will not materially destroy and affect the food supply of other kinds of game.

7. In the action of the Commission no age or weight limit was fixed regarding anterless deer. The subject was considered in the light of experience, and it was concluded that the attempt to do this so as to avoid the killing of young deer was almost physically impossible and very impracticable.

8. The Commission had the advice and assistance of the Federation of Sportsmen's Clubs. Local Sportsmens Clubs in various counties belong to a kind of Federation, and they together are organized into a Division Federation, and all of them in turn attached to a part of a state wide Federation covering about 60 of the 67 counties of the Commonwealth.

After hearing the evidence presented and seeing the results of the research study the officers and directors of the Federation of Sportsmens Clubs adopted a resolution recommending to the Pennsylvania Game Commission a statewide open season for antlerless deer this year, and no open season for male deer.

9. Deer conservation work is a science taught in the colleges of the Commonwealth and elsewhere.

10. In the South Mountain range there is not sufficient food for the present deer herd. The result is a deterioration in the size of the animals, their general health and physical condition. It also has the effect of crowding them on neighboring farms to forage. Also the food and cover on the forest floor is denuded to the detriment of other game, such as grouse, rabbits, and quail.

11. In 1931 there was a closed (an open) season in the South Mountain range which resulted in the material reduction in the number of animals using it. There are now a great many more than there were immediately following the 1931 season.

12. To allow a further increase of deer in the South Mountain range will be a constant source of annoyance to land owners, and will seriously affect the small game cover and food in the various areas.

It will also be a menace on the highway.

13. The true deer range consisting of territory adapted to the normal, natural life of deer in Pennsyl-

Court Upholds Game Commission's Regulatory Powers

vania, is approximately 8,000,000 acres. In the last 20 years no deer have been planted in counties other than those which lie in the true deer range. The deer found in the South Mountain range drifted there because of food conditions, or being frightened by the large number of hunters.

This is the process by which parts of the deer herd have drifted until some are found in every county of the state, in many of which the conditions are unnatural and undesirable. Of the 1579 townships in the state deer may be found in all except 75. Numerous complaints from damage of farmers and orchard growers have induced the legislation authorizing the Commission to furnish deer-proof fencing to the large extent of, to wit: $10,000 per year. Farmers have also been permitted to kill deer committing depredations on their crops, gardens, and orchards. Complaints have been made by the Department of Forests and Waters about the deer herd. The deer eat the seedlings set out in the attempt to conserve and increase the forests. All of these things were taken into consideration by the Game Commission before its action of July 13.

14. General resident hunter's licenses for 1938 approximate 600,000. Not more than 1/3 of them hunt deer.

15. Publication of the resolution of July 13 was made twice in each of two papers in the various counties. The final notice was August 27; the first being August 10.

16. In 1925 (1935) there was on apen season for antlerless deer when no permits were required. In 1931 was an open season for the entire state, with no permits required, and in 1928 the entire state was open for antlerless deer without permits, and no bucks were allowed to be killed.

17. In order that there might be ample time for deliberation, advice and objection the Commission this year sent out its notices at least two months ahead of the time which had been practiced in former years; and the notices to the newspapers were mailed out on August 9 instead of waiting until October.

18. It is probable that there are considerably more than 1,000,000 deer in this Commonwealth.

19. In the South Mountain where for every buck of breeding age there are at least 15 other deer, principally females. This is a bad condition from a biological and conservation point of view. The more correct biological ratio for deer in the wild state would be one buck to one doe. This conclusion is arrived at by biologists from accurate reports in the forests of Germany for a period of upwards of 900 years.

20. It would be inexpedient and impractical to regulate the deer problem in the South Mountain area by itself because of the management of kills in the attempt to regulate hunters in one particular area. It was tried in 1936 with great disadvantage.

21. The deer herd is too large, and the ratio of the sexes is unbalanced throughout the Commonwealth.

The action of the Commission complained of was not unreasonable, arbitrary or oppressive, nor an abuse of its discretion.

22. The action of the Pennsylvania Game Commission in declaring the open season was supported by facts sufficient to justify such action, and the Commission made the necessary findings to support its action within the powers delegated to it.

DISCUSSION OF QUESTIONS OF FACT AND THE LAW INVOLVED

The ownership, jurisdiction and control of the herd of deer in Pennsylvania are in the Commonwealth, in its sovereign capacity, as provided by the Game Law of 1937, P. L. 1225.

The management of this public property is a police regulation vested in the Game Commission which, as an administrative agency, is subject only to the limitations fixed by the Legislature.

On this Commission devolves the duty to protect, manage and preserve the game.

It must do so within the limitations of the authorizing acts.

Plaintiffs assert: That the fixing of an open season for antlerless deer, as attempted by the resolution of the Commission of July 13, 1938, violates the express requirements of the Act and exceeds the powers conferred.

The Act referred to is the Game Law of 1937, and what is said to be the express requirement violated is: That in section 501 of the Act which provides that the Commission may remove protection and declare an open season, through the Commonwealth or any part thereof, for any game, for certain reasons.

The open seasons are according to the table fixed by the Legislature, if in any year the Commission fails to establish some other seasons.

Then follows the provision stressed by plaintiffs: "Deer without visible antlers or horns of such minimum weight or age as shall be fixed by resolution of the Commission", and "No open season except as fixed by resolution of the Commission."

Plaintiffs contend that this means that the Commission may not declare an open season for antlerless deer unless, in the resolution, it fixes the minimum weight or age of such as may be killed; that the law is mandatory and is not complied with unless some minimum weight or age is fixed, even though the question has been considered and no minimum fixed; with the effect that any antlerless deer, no matter how small or young, may be shot in the open season.

Considering the whole Act and its expressed policy and reasonable implications, we are not convinced that plaintiffs' position on this point is correct.

The reasonable construction is that: The Commission may fix an open season in which deer without visible antlers or horns may be killed, with the exception of such deer as may be below the minimum weight or age, if such minimum weight or age shall be fixed by the Commission.

The position of the plaintiffs that the Commission may not fix an open season for antlerless deer, unless it shall fix such minimum weight or age, does not seem reasonable and is rejected.

Plaintiffs further insist that, even if the action of the Commission, in fixing no minimum of weight or age under which antlerless deer may be shot in the open season is not mandatory, the action of the Commission was an abuse of the discretion vested in it, and is arbitrary, oppressive and capricious.

Evidence received, subject to objection, fails to establish any basis for these charges.

On the contrary, there appears, without contradiction, to have been careful, expert and scientific performance by the Commission of its duty as agency of the Commonwealth to protect, propagate, manage and preserve the game of the Commonwealth in accordance with its laws.

The similar criticism is without substantial basis: That the resolution is defective in omitting specific findings of fact within the powers delegated to the Commission.

It is evident that the General Assembly cannot enact laws which shall keep abreast of the constantly changing status of the deer of the Commonwealth.

The case presented is not one in which any private rite is alleged to be infringed; and is not governed by such decisions as Holgate v. Bashore, 331 Pa. 255.

The doctrine of U. S. v. Grimaud, 220 U. S. 501, is applicable; which has been followed in other jurisdictions, such as People v. Soule, 213 Northwestern, 195 (Michigan).

This legislation for the conservation of public property is an exercise of the police power inherent in the sovereign. No private rights are involved. The Commission makes no new law. It determines the conditions outlined within the limits of the law, and pursuant to such determination promulgates its orders.

Such orders are not analogous to that class of laws, and the decisions under them dealing with commerce, public utilities, et cetera, where private interests are involved and hearings of those whose property or personal rights are involved are required.

Such authorized administrative orders, auxiliary to such purely police regulations of public property, are no more open to trial than the legislation authorizing them.

If this be correct, it is incompetent for the Court to enter into the wisdom of the order, or reinvestigate the conditions which led the Commission to arrive at its duly announced judgment.

The plaintiffs are allowed a privilege to be exercised under such conditions as may be imposed by the administrative agency of the Commonwealth. It is not competent for such licensees to invoke the interposition of the Court to determine whether the duly arrived at and publicly announced judgment of the Game Commission is, under the circumstances, wise. Such a practice would lead, as illustrated by the case before us, to confusion and would be practically impossible.

The offer made by plaintiffs as to the general conditions affecting the deer herd in the Commonwealth, and in the several counties thereof, might well have been excluded. The evidence received thereunder, however, was illuminating and showed nothing to sustain plaintiffs' case.

It was argued on behalf of the plaintiffs that the phraseology of the Act left the question of the open season for deer to the unlimited discretion of the Commission.

Section 501 provides that the commission *may*, by appropriate rules and regulations and so forth, declare an open season when, in its opinion, such action is necessary to secure the maintenance of an adequate supply of such species, or when an unbalanced sex ration exists which, in its opinion, should be corrected or when, in the opinion of the Commission, such additional open game season will not jeopardize the future supply of game.

It is said that the statute does not determine what limitations are placed upon the exercise of that power. In view of the whole Act and the public policy involved regarding this property of the Commonwealth, this criticism does not appear to be valid.

The proper management of the deer herd depends upon the duly ascertained result of expert biologists and is a matter of scientific investigation and conclusion which cannot be arrived at by any general law.

The opinion of the Commission, after such due investigation as the evidence shows was made, is a fact; which, when evidenced by the Commission's resolution, becomes the basis for the application of the provisions of the law by the resolution involved in this case.

We are unable to reach the conclusion urged on the part of the plaintiffs for the fixing of the open season, as was done by the Commission, for antlerless deer, is unconstitutional or obnoxious to any valid objection.

It is not clear what rights any of the plaintiffs have which can or should be protected by the injunction prayed for. The result of the Commission's action is to enlarge the privilege of every licensee.

Practically, plaintiffs are asking that their privilege, together with others, shall be curtailed, at least in some of the counties, because in their opinion the conclusion of the Commission, after full investigation with the concurrence and approval of the organized sportsmen of the State, is not to their liking.

The police regulation and management of public property must necessarily be lodged in some administrative agency, subject only to the general limitations fixed by the representatives of the people.

The wisdom of the regulations may not be attacked and reviewed in such manner as is attempted by these plaintiffs without showing some material disregard of the limitations, or some abuse of discretion, arbitrary or capricious.

The whole record in this case fails to show any such vital defects. There is nothing to indicate that plaintiffs or any of them are or can be damaged by the action of the Commission complained of.

The argument regarding the unconstitutionality of the Act, because it delegates to the Commission legislative functions, is somewhat inconsistent. It is admitted that all of the Act is constitutional except the paragraph referring to deer without visible antlers.

There is pointed out no logical basis by which the delegation of the power to fix an open season for antlerless deer is unconstitutional, and the power conferred on the Commission by the same Act to fix an open season for elk, for instance, is constitutional.

In the limited time allowed for consideration of this somewhat complicated case, it would seem that the only point of substantial doubt is: Was the failure of the Commission to fix by its resolution a minimum weight or age of deer without antlers which might be killed, such an omission as made its action in that regard unauthorized by law. As has been intimated, in our opinion it was not.

The conclusion arrived at in the instant case is not in conflict but is in harmony with the decision of Judge Fox in this court, in Dietz and others against The Game Commission, 45 Dauphin County Reports, page 30.

Under all of the circumstances of this case, the failure of the plaintiffs to apply for the injunction more promptly impresses the Court that they should be charged with such laches as should warrant the Court in refusing equitable relief at this late date. They allowed fifty-nine days to elapse between the last legal publication of the Commission's resolution and the filing of their bill. Should the injunction be granted as prayed for, it would necessitate the revision and publication of other regulations which would be difficult, if not practically impossible; or, to allow a full discussion upon exceptions and a proper appeal to the appelate court, before the date fixed for the antlerless deer season, and in the meantime the fixing and enforcement of game regulations for the current season would be in a chaotic condition.

The uncertainty and the damage to the public interests would be disproportionate to any advantage to the plaintiffs.

Upon this record as it stands at this time, the prayers of the bill and the injunction prayed for will be refused.

CONCLUSIONS OF LAW

(1)

The fixing of an open season for all antlerless deer without minimum weight or age requirements, open to all licensed hunters and covering all counties and areas without regard to the number of deer in each, does not violate the requirements of the Game Law and does not exceed the powers conferred upon the Game Commission.

(2)

Plaintiffs are guilty of laches in failing to take action until too late to allow for hearing, consideration and decision by this Court and orderly review there of; and for other public action by the Commission in case it be required.

The bill was not filed until October 24, and the case brought before the Court, November 10 and 11. Only eighteen days remained for consideration before the open season. This was due to the laches of plaintiffs.

DECREE NISI

Upon the consideration of the foregoing case, it is ordered, adjudged and decreed as follows:

The injunction prayed for by the plaintiffs' bill is refused, and the bill is dismissed at the cost of the plaintiffs.

NOTE—The Prothonotary shall enter the decree nisi and give notice to the parties or their counsel of record of the entry of decree.

(Signed) HENRY C. NILES, P.J
Specially Presiding

(Signed) F. B. WICKERSHAM, A.L.J.

November 18, 1938.

CURRENT TOPICS

Typical of the Game Commission's mailing room during an influx of game kill reports. Is yours among them?

The Game Refuge System was recently expanded to include the following Primary Refuges: State Game Lands No. 60 in Centre County, 392 acres; No. 522-F on State Forests in Union County, 238 acres; No. 531-A, 630 acres; 531-B, 230 acres and 531-C, 360 acres, all on State Forests in Monroe County. Primary Refuges Nos. 511 and 522 were reduced in size and Primary No. 519-A on the Allegheny National Forest in Warren County was discontinued.

The following Auxiliary Refuges were established: No. 112-A, 37 acres and 112-B, 34 acres, both in Columbia County; No. 113, 46 acres in Lycoming; No. 114, 172 acres in Bedford; No. 115, 100 acres in Blair; No. 116-A, 39 acres, No. 116-B, 16 acres, No. 116-C. 5 acres, and 116-D, 43 acres, all in Northumberland County; and No. 118, 46 acres in Columbia County.

The American Humane Association announces the opening of its twelfth annual humane trap contest. The contest closes April 30, 1939; $550.00 in regular and $125.00 in special prizes is offered as follows:

Traps for taking animals alive and unhurt —First Prize—$150.00—Second Prize—$75.00; Leghold Type (Traps that hold without injury)—First Prize—$100.00—Second Prize—$50.00; Traps that kill humanely—First Prize —$85.00—Second Prize—$40.00;General Charles McC. Reeve, Special Prize, $50.00.

A total of $125.00 in special state prizes is also offered for entries from Illinois, Massachusetts, West Virginia and Wisconsin.

The purpose of these annual contests is to stimulate an interest in the development of humane devices and the use of humane methods for taking animals when necessary to take them. Humane traps will not only solve the humane trapping problem but also prevent wanton waste of our valuable wildlife.

All are eligible to compete. For entry forms or further information write the Wildlife Department of The American Humane Association, 135 Washington Ave., Albany, N. Y.

Your attention is again invited to the Fourth Annual North American Wildlife Conference sponsored by the American Wildlife Institute to be held in Detroit, Michigan, the week of February 13. The National Wildlife Federation will also be held in conjunction with the Wildlife Conference.

Hunting and fishing has increased 15 per cent in popularity in one year, according to figures recently compiled by The American Wildlife institute from official government data. The upswing took place in 1936, the last year for which accurate figures are available at the present.

In 1935 there were only 5,988,064 hunters' licenses and 5,832,448 permits to fish issued. This made a grand total of 11,820,512 licensed to enjoy both sports.

In 1936 hunters' licenses jumped to 6,658,158, or an increase of 670,094. Fishing licenses the same year went up to 6,901,587, representing an increase of 1,069,139. The total for 1936 was 13,559,745, or an increase of 1,739,233, which is 15 per cent higher than the 1935 figure.

These figures indicate that more than 10 percent of the entire population of the United States, which the United States Census Bureau estimates at 129,818,000, has been licensed to either fish or hunt.

R. A. McCachran, Asst. Director of Refuges and Lands, In Charge of Land Acquisition, was the guest of the Milwaukee Chapter of the Izaak Walton League of America on Monday evening, November the 28th, the invitation having come from the Hon. Haskell Noyes, one of Wisconsin's most prominent sportsmen and formerly chairman of the Wisconsin Conservation Commission.

The Northeastern Division of the Wildlife Society will hold its meeting in Boston next year, February 3 to 4 inclusive, in conjunction with the New England Game Conference.

Notwithstanding the heavy kill of antlerless deer during the past season, the Pennsylvania deer herd has not been jeopardized. While there was much needless carelessness, there is ample seed stock left in all the real deer country, and the herd will doubtless multiply just as rapidly as it has after previous antlerless seasons, following which the annual kill of antlered bucks has gradually climbed higher and higher. During the twenty-three seasons prior to 1938 Pennsylvania recorded a kill of 281,000 antlered bucks and only 150,000 antlerless deer.

Thousands of hunters respected the Commission's wishes and confined their efforts mostly to outlying territory adjacent to the farms, but others went to the extensive wooded areas where they had hunted deer in previous years. The heavy snow made travel difficult and reduced the kill in the big forest regions, and also greatly reduced the illegal kills and hunting accidents.

Even though the kill of illegal deer was needlessly large, early indications are that the percentage in relation to the total number of deer bagged will be considerably smaller than during the 1937 buck season. During the seven previous seasons when only one kind of deer was legal the average kill of illegal deer was one (1) to every seventeen (17) legal animals. The snow enabled sportsmen and officers of the Commission to spot illegally killed animals, and far fewer unreported carcasses remain in the woods than previously.

The number of accidents was considerably lower than previously due to snow and universal wearing of red. The fourteen-year average was fourteen (14) fatal and thirty-one (31) non-fatal. In 1931, when both bucks and does were legal, thirty-seven (37) men lost their lives and seventy-five (75) more were injured.

Notwithstanding the carelessness on the part of too many hunters, a higher percentage of them proved themselves to be real sportsmen than ever before. Dozens of hunters who made mistakes and killed animals with spikes or racks reported their mistakes immediately and saved $50.00. Other cases are under investigation and many $100.00 fines will be collected in the next few weeks.

Hunters everywhere reported an unexpectedly large percentage of "runt" deer in the woods this year, many adults being little larger than good sized fawns. This clearly proves the Commission's conclusion that the deer herd has been deteriorating due to lack of food. The number of bucks with large racks of antlers observed by the hunters was much smaller than anticipated, and sportsmen generally are commending the Commission for not allowing the killing of antlered bucks this year.

Due to the late fall, deer generally were fat and in excellent condition, but food conditions generally are reported as very unfavorable, and should the winter be severe thousands of small deer will perish by February and early March.

The complete figures on the kill of deer and hunting accidents will not be available until after this goes to press, but present indications are that the Commission's early estimates of approximately 100,000 deer bagged

CURRENT TOPICS

Over 1000 persons attended the dedication services of the Captain Phillip's Monument near Saxton recently.

will not be far wrong. Numerous interested sportsmen are again suggesting that when the herd builds up to the point where another antlerless season would be necessary the Commission should arrange to trap and transfer the surplus animals. "Those who make such suggestions do not know how difficult it is to trap widely scattered wild deer. To trap and ship 100,000 deer would cost about $1,500,000.00, or more than the entire Game Fund income for a year. All our real deer range is adequately stocked, and the remaining forty-seven states combined would not take 100,000 of Pennsylvania's deer and pay for the cost of trapping and shipment. Many of them have 'deer problems' of their own.

Even though the deer herd may temporarily have been thinned out too much in certain localities, in other sections early reports indicate that not enough deer were removed to relieve farm crop damage. This was true especially where landowners posted their lands.

The deer herd will again build up very quickly, and there is no need for alarm.

NOTES FROM THE FIELD

An interesting preliminary check on Livermore Controlled Shooting Area in Indiana County shows approximately 1000 Rabbits killed in this Area. A similar check, with less definite information, shows a like number taken on Farm Game Protect No. 50, Collier Township, Allegheny County.—Division Supervisor Rollin Heffelfinger.

In the Pond Eddy section of Pike County, Game Protector John H. Lohmann told me there were eighteen bears killed, sixteen of them being females. They were all very fat, feeding on an abundance of acorns that were present.—Division Supervisor Jay C. Gilford.

Mr. Aden G. Brinker, of Furlong, Pa., reports finding a dead carrier pigeon on his farm with Band No. IF38S54932. Any information regarding where this pigeon might have been released from will be appreciated by the finder.

"On November 6 there were two bucks fighting within about 100 yards of the refuge house. They could be very easily seen in the moonlight as they moved about, and you could hear their horns clanking together. I later put the spotlight on them but they were not the least bit afraid; they only ran a short distance, stopped, looked at the light a little while, and commenced fighting again. One was a four point, the other a six point."—Refuge Keeper Chester Siegel, Lycoming County.

"I went to the home of Mr. Bailer on November 20 to interview him concerning a deer reported seen in that vicinity with a wire cylinder covering its head. The wire cylinder, approximately 9 inches in diameter and 14 inches long, was evidently forced over the deer's head when it attempted to browse on flower plants encircled by the cylinder. Spikes about 3 inches long helped to make it secure. This deer was reported seen for approximately two weeks, and seemed to be getting along fairly well as the cylinder, open at both ends, was forced back in line with the nostrils."—Refuge Keeper Gilbert Bowman, Lackawanna County.

During the first fifteen days following the dedication of the Pymatuning Waterfowl Sanctuary on October 15, and the opening of the Commission's educational Museum on Ford Island, a total of 4,095 persons registered at the latter institution and over 17,000 visited it; during the first fifteen days of November 1,419 persons registered and the estimated number of visitors was 6,800.

Lieutenant Colonel Nicholas Biddle, President of the Game Commission, recently passed on a story he heard from Game Protector Arthur N. Frantz, of Monroe County. It seems that a certain farmer, who was violently opposed to the doe season, and who threatened to post all his lands, collided with a doe recently and sustained considerable damage to his automobile. In addition he discovered that a lot of spruce trees that he had planted had been clipped by the deer. The result was that overnight he became a strong advocate of the antlerless deer season and will open all his lands.

"A wit points out the dove brings peace and the stork brings tax exemptions. We've also noticed when the season is closed a pheasant invariably brings a Game Warden."—*Foreign Service, V.F.W.*

The above are officials from the Michigan Conservation Department who spent several days in our forests during the deer season. Left to right: I. H. Bartlett, in charge of Deer Conservation, W. A. Bergin, Asst. Chief Field Administration, and Joe Stevenson, Asst. Chief of the Game Division.

CURRENT TOPICS

White skunks are the exception not the rule.

"ODDITIES IN THE NEWS"

Unusual technique while hunting rabbits was demonstrated by Ed. J. Gaul, of Washington, Pa., who shot at one running along a fence. When he picked it up he found that he had collected not one but two rabbits. The other had apparently been sitting in the underbrush.

A driver and thirty women passengers were hurt seriously as a bus bound from Sheffield to Kane recently collided with a deer and then swerved into a ditch. The driver said the animal, a doe, became wedged in the steering rod, throwing the bus out of control.

Cameron County students were given the first day of deer season off because school authorities figured it would take an army of truant officers to keep the youngsters in classes.

Two bears and four cubs having a feast on dead deer in the middle of the highway near Kane refused to budge when Maurice Erickson came along in his truck. Erickson decided he wasn't in any hurry and waited patiently until the bears had finished their repast and ambled away.

PROGRESS IN THE ACQUISITION OF

IT develops that we have been somewhat remiss in not having kept sportsmen better informed of progress being made in connection with the Land Purchase Program. Much to our surprise we find that we have not published in the GAME NEWS the various tracts which have been acquired since August 1937. Our apologies are offered and now we will try to make amends.

All tracts for which titles have been secured since those reported in the August 1937 issue of the GAME NEWS are listed in the following statement. They brought the aggregate area of State Game Lands to 588,418.5 acres and in addition to this approximately 43,780 acres are under contract for purchase.

TRACTS CONVEYED BETWEEN AUGUST 1937 and OCTOBER 1938

County	*State Game Lands Number*	*Grantor*	*Acres*
Armstrong	137	R. R. Hodgson	1,113.8
Bedford	Addition to 48	Artnur P. Baugh Jr.	600.0
		Bedford Lumber Company	1,646.2
Bedford	Addition to 97	S. G. Burket and wife	255.7
Blair	Addition to 118	Borough of Williamsburg	105.6
		Borough of Williamsburg	105.8
		Mrs. Juniata Tinkham	50.8
Blair	147	Altoona Properties Inc.	2,432.0
		County Commissioners	559.5
		Elizabeth Patton Hemphill	393.2
Bradford	Addition to 12	Charles Wernett	97.3
Bradford	142	Pennsylvania Joint Stock Land Bank	277.7
Bucks	139	Rock Hill Granite Company	154.2
		Samuel L. Musselman	5.1
Butler	Addition to 95	John C. Royle Heirs	118.1
		A. Shidemantle Heirs	179.5
Cambria	Addition to 108	George Grazonick	8.5
Carbon	Addition to 129	Jacob C. Loose	454.1
Carbon	141	Harry C. Trexler Estate	1,099.1
Centre	Addition to 92	Edward M. Bate and others	198.7
Clarion	Addition to 45	S. B. Boocks and others	117.3
Clearfield	Addition to 90	Grampian Rod and Gun Club	401.2
Clearfield	Addition to 120	Hugh M. Irvin Estate	1,746.4
Crawford	144	Mrs. Katherine Streich	105.1
		Crawford County Commissioners	151.0
Crawford	146	Herbert Borrell and wife	495.8
Crawford	152	Aletha B. McBride, Extrx.	97.0
	152	James A. Kearney Heirs	252.0
Elk	Addition to 25	Manor Real Estate Company	13.29
Elk-Cameron	Addition to 14	Kaul and Hall Oil and Gas Company	1,621.8
Fayette	138	Carnegie Land Corporation	1,387.3
		James C. Scholl ¾ interest in Union Trust Company ¼ interest in	1,030.7
Fayette	Addition to 51	George A. Leapline	15.5
Fulton	Addition to 53	Robert G. Alexander	11.3
Fulton	Addition to 65	Nicholas Snyder	395.0
Fulton	Addition to 128	J. B. Pittman	161.2
Huntingdon	Addition to 81	Altoona Properties Inc.	247.9
Juniata-Mifflin	Addition to 107	Borough of Lewistown	16.6
Lackawanna	135	Charles P. & Myra O'Malley	300.5
		Herman Hagen Estate	416.9
		Alfred P. Hagen and others	254.3
		Charles F. Wagner and wife	167.2
Lancaster	136	Marvin S. Evans	91.0
Lawrence	148	Administrator of Katharine E. Vance	89.5
		Administrator of Katharine E. Vance	50.8
		Mike and Minnie Klutt	77.3
		Samuel Shurlock	46.4
Lawrence	150	Rufus M. Lutton	63.3
		Ruth K. Schultz and others	119.1
Lawrence	151	Will B. Hamilton and wife	180.8

CURRENT TOPICS

STATE GAME LANDS—By W. Gard Conklin

Lebanon	145		Department of Military Affairs	2,157.3
Luzerne	Addition to 119		Hugh R. Lewis	1,080.7
Luzerne	149		George Fox, Jr.	428.7
Lycoming	134		R. W. Thomas	696.8
			G. E. Rohrbach and others	871.4
Mercer	130		Patrick Flynn and wife	50.6
			J. A. Winner Estate	75.0
Monroe	Addition to 129		Francis J. Faust and wife	389.1
Somerset	Addition to 111		C. L. Shaver and wife	584.7
			Rosie Durst, et al	17.7
Sullivan	Addition to 66		Payne P. Sturdevant and others	1,295.1
Susquehanna	140		Federal Land Bank of Baltimore	304.3
Susquehanna	Addition to 35		A. M. Summers and others	199.9
Tioga	Addition to 37		Mrs. Lenna M. Gibson	1,160.7
			Daisy Loveless	532.2
			Elmer K. Snell Estate	393.8
			Matilda D. Jones	46.9
			Tioga County Commissioners	51.0
Venango	Addition to 39		Lewis B. Hart and wife	89.7
			Lewis B. Hart and wife	.2
Warren	143		C. R. Moore and wife	4,508.7

The Commission, at a meeting held October 5, 1938, accepted 14 offers, conditionally accepted 8 others, and made counter offers for 15, most of which were agreed to. As this is being written, purchase contracts are going through the process of execution. The following statement (or the statement on page) includes all tracts acted on October 5 which will definitely be under contract for purchase before this article appears in print.

TRACTS APPROVED FOR PURCHASE OCTOBER 5, 1938

County	*Township*	*Adjacent to*	*Owner*	*Acres*
Bedford	Londonderry	104	Edward F. Shroyer	106.0
Blair	Catharine	Beaver Dam Section	R. T. Norment	1,757.0
Bucks	Haycock	Other tracts under contract	Anna Zimmer	5.0
			Webster Zinger	12.0
Erie	Wayne	Other tracts under contract	Fred Wallace	50.0
Erie	Amity	Other tracts under contract	Otto C. Bueg	180.0
Fulton	Belfast	65	R. G. Alexander	100.0
Northumberland	Zerbe, Coal & Shamokin		Whitmer Steel Co.	1,271.0
Schuylkill	Washington		Federal Land Bank	248.0
Somerset	Lower Turkeyfoot	111	The County Trust Co.	180.0
Warren	Pittsfield	143	Minnie C. Lindblade	125.0
			Minnie C. Lindblade	275.0
			May Ball DeForest and others	100.0
			E. W. Anderson	125.0
			George E. Seavy	520.0
Wayne	Lebanon	Tanners Falls Development Co.	R. B. Henderson	208.0
			David D. Gager	40.0
			G. D. Gager	60.0
			R. J. Stiles	65.0
			Pearl G. Shuman	200.0
			Pearl G. Shuman	65.0
Beaver	Ohio	Beaver Trust Company	Mrs. Susan Laughlin	166.0
Schuylkill	West Cameron	84	Kulp Lumber Company	84.0
Northampton	Moore		A. H. Rauch Estate	725.0
Columbia	Beaver	58	Mrs. Mary Klingerman	400.0
Luzerne	Bucks & Bear Creek	91	Lily L. Seneff and husband	1,380.0
			Lily Lewis	1,866.0
Luzerne	Dennison	119	Luzerne Ochre Manufacturing Co.	1,241.0
Huntingdon	Cromwell	99	R. D. & J. F. Whitsel	483.0
			R. D. Harper and wife	397.0

"ODDITIES IN THE NEWS"—Cont.

Tularemia is never transferred from man to man. Infection comes from contact with an infected rabbit or other small field animal or from an insect that has fed upon an infected animal.

Harold Tobey, general foreman of the Ontario and Western Railroad roundhouse at Childs, is pondering whether he went on a hunting or fishing trip recently.

While stalking pheasants his attention was diverted to the swift dive of a fish hawk into Robinson Pond. Tobey drew a bead and brought the bird down. When he recovered the hawk he found a three pound pickerel clutched in the bird's talons.

Mr. Joseph Wright of 1200 Bartine Street, Harrisburg, was carrying a doe through the woods when a fellow hunter took a crack shot at it thinking it was alive. However, the bullet went through the sleeve of Mr. Wright's coat thereby causing him to drop to the ground. As he arose the so-called "sportsman" took to his heels and made a quick get-a-away without lending any assistance whatever.

George W. Gates, of Beavertown, had the peculiar and exciting experience of seeing his dog chase a rabbit directly towards a big buck. It was a surprise encounter all around, but the big buck acted first, catching the dog on his antlers and throwing him back over his head. The dog yelped at this peculiar turn of events, and with blood streaming from his side made a bee-line for home.

Racing into the Derry engine house of the Pennsylvania Railroad Company a big buck deer with a fine rack created plenty of excitement. The deer came up along the railroad track, through a building which was connected with the ash pit and leaped toward the turn table pit. Safely negotiating the turn table pit he dashed into the engine house. After running around inside this building the animal found an open window and with a flying leap cleared it and departed south toward Chestnut Ridge.

While returning from Homestead, Lawrence Montgomery, of New Castle, had the unusual experience of having a doe deer jump completely over the hood of his automobile and scamper away unhurt into the woods on the other side of the road.

STOLEN

Model 29 Remington Pump, No. 33407. If located notify Lawrence Basso, 496 Girard Street, Atlas, Pennsylvania.

LOST

All tan hound dog named Trailer. Lost near Unger's Gap, Dauphin County, Saturday, November 5. If found notify Arthur J. Ransom, 2432 Elm Street, Penbrook, Pa.

HOW A MUSEUM SERVES CONSERVATION

(Continued from Page 19)

object in its three dimensions. Teachers are well aware that assorted facts, ideas, and theories, ordinarily difficult to put across, remain steadfast in the mind if interpreted through some visual means, whether it be the motion picture of a forest fire or the specimen of an owl. Second, the schools, at least the forward-looking ones, realize that a knowledge and appreciation of natural history not only increase a child's information but leads to a better understanding of the world and can enrich and make happy a whole life-time.

But there are other opportunities, besides the formal classes for learning and enjoying in a museum. A museum as a center for natural history information can also be a center for fun and entertainment. Every Saturday morning, groups of youngsters swarm up the steps of the Academy of Natural Sciences to take part in one of its several nature clubs. Here there is many a chance to sketch the exhibits, study the habits of live animals in miniature zoos and aquariums, compile scrap books and play nature games. Older children with more advanced interests can make nature collections which teach them much. Or they can study the behavior of creatures with the intent of professional scientists, compiling formal reports and holding discussions on their investigations.

This autumn the clubs chose the topic of conservation for their activity. The junior group of youngsters, from nine to twelve, divided themselves into sections and chose the particular subjects they found of most interest. Their topics included a lumber camp, a scene after a forest fire, a flood, a coal mine, a polluted river, a fish hatchery and a game preserve. Each group drew up its plans and sketched them on paper. The actual construction began after the plans received the approval of the Museum staff member who acted as club leader. The group found that they could express their ideas in such a variety of materials as plaster-of-paris, modelling clay, wood and cardboard. The children look forward to exhibiting their project in a Club show at the end of the year. On the other hand, the older club spent some time in discussing the general topic of conservation. They witnessed a short movie which illustrated a number of points. Then, they chose individual subjects for their own study. Later, each one will present before the group a paper with their findings. They also aided the younger club by selecting subject for the construction projects.

At the same time, the educational program at the Academy does not neglect the interests of grown persons. It provides gallery tours in the Museum and sends out members of its staff to lecture to church and social clubs, parent-teacher organizations and many others. Recently, the educational department offered a popular series of natural history talks over the Philadelphia radio station, WIP. These "Expeditions to Everywhere" broadcasts consisted of informal discussions, as well as dramatized presentations of expeditions in far lands as well as trips through the Museum. Another educational service of the Academy of interest to a wide audience of grown people as well as children is the popular publication, "Frontiers": A Magazine of Natural History, which contains articles on a variety of phases of nature.

Also, the Academy concerns itself with outdoor nature recreation for young people as well as the older generation. With its scientific resources and educational staff the museum is in a unique position to serve the nature interests of a wide community. Important is the fact that there exist a multitude of sources of nature interest in the metropolitan district of Philadelphia. Within the urban area is the Fairmount Park system, a series of perserves of some 3,800 acres, the largest natural park located inside the limits of a city. Here wind trails through woodland glens where a few blocks from the roar of traffic one finds forest trees and an abundant bird life during spring and fall migrations. At the city's edge, within reach of trolley line or bus there are marshes in which waterfowl alight in the quietness of the reeds. Nearby lie fields and woodlands where plant and insect life is rife three seasons of the year. Up until recently there has been no organized effort to make the most of these nature resources in the way of revealing and explaining them to city dwellers.

This summer the Academy offered a nature recreational program for all classes of persons who were forced to remain in the city. It comprised a series of offerings of travelogue and nature lectures, gallery tours, clubs and training courses for nature leaders in summer camps and at playgrounds. Especially attractive to adults, eager for nature adventures but lacking guidance were the "Expeditions in Philadelphia". These were nature field trips, conducted by the Academy's educational staff in nearby city parks. So popular did this service prove to be, a total of some two thousand persons took part in the various activities. At popular request an additional series of local field trips was scheduled for the fall months, which were held on Saturday afternoon so that business men and women could take the fullest advantage of the opportunities. And it is worthy of remark that the principle of conservation was the recurrent theme of these varied meetings. For the participants, both young and old, soon discovered that the nature-minded person is as well a conservation-minded individual.

TAKING CONSERVATION INTO THE SCHOOLS

(Continued from Page 15)

The third phase of this part of our educational program, and one which naturally follows the first two mentioned, is to obtain the actual teaching of conservation in our schools. We feel that conservation is of great enough importance that it should be taught from the first to the twelfth grade in every school—city and county—negro and white. However, a study of the results of twelve years teaching with an adopted course and textbook in the fifth grade, made us believe that there should be better methods to teach conservation than through courses enforced by law.

Conservation, health, safety—any set of important attitudes—may be taught in several ways. The traditional method is to adopt a text and teach directly from that text, at a certain hour every day for a certain number of weeks. Fortunately, I now find that Tennessee was one of only a few states to pass a law requiring the teaching of conservation in any particular grade and in this manner. To those of you in other states who might be thinking of initiating similar action, I would like to say that I believe there *is* a better method of obtaining the teaching than by this enforced method. The State Department of Education in Tennessee has for the last five years been doing extensive work in the improvement of the existing curriculum—in an effort to get away from the traditional teaching method where the teacher was a slave to the text.

In the traditional old fashioned school of America the textbook is almost as important as the teacher. Most teachers follow the textbook page by page with no variation. The teaching procedure of the text is accepted. We feel that, particularly in conservation, any text must be too narrow in several ways for the proper teaching of the subject. A text is too limited in the amount of suitable material and it is too didactic and pre-organized. Even the existent flood of improved textbooks is insufficient to serve the need of the child who is developing as he should. To meet this problem, the Department of Education has developed in our state a method of instruction that has been developed in several other states —a system of teaching by the use of *units of work*, based on actual conditions and experience.

A teaching unit which makes use of local conditions and local problems—it is based upon real and meaningful situation so that the formal tools of reading, writing, and arithmetic are not learned in isolation. This does not mean that these basic principles are not learned. They are introduced as they are needed and there is ample evidence that they are learned more readily and permanently in this way—that is, through application. In other words, why can a child not learn Arithmetic just as well by the use of problems involving the increase of game, forest fire loss, lumbering operations, etc., just as well as by the use of problems involving the sale of so many dozens of eggs by Farmer Brown?

Why cannot it be possible to learn English and Science, and Fine Arts, by the use and study of conservation problems? We believe that in this way—teaching through, and in terms of, experience—real conservation attitudes can be developed just as are attitudes regarding health, safety and social responsibility. In short, in Tennessee we are seeking to teach conservation by the use of teaching units which may be integrated with every existing course in the present curriculum in

TAKING CONSERVATION INTO THE SCHOOLS

such a way that the formal tools of learning are acquired through the means of conservation as a general theme. We have then in our own minds abandoned the idea that conservation can best be taught by means of an adopted textbook and we are turning all our facilities and ability into an effort to cooperate with the State Department of Education in the preparation and use of conservation teaching units, applicable to every grade and every course from first to twelfth grade, in every school in the state. We do not believe that it is the function of the Department of Conservation to prepare these teaching problems—in short, by regularly constituted teaching authorities.

Methods of preparation which we are using at present might be summed up as follows: in connection with the larger teachers' colleges of the state, there are training schools for practice teachers. Trial teaching units are being prepared by teachers and then used in these training schools. Other teachers have prepared teaching units during summer months at teachers' colleges and then applied their work during the school year in their particular schools. After they have then tried these units, they are taken by teaching authorities into the curriculum "laboratories" of our three largest teachers' colleges where they are studied and discussed and put into better shape. During this present summer, fundamental or "key" units—are being prepared in the largest curriculum laboratory of the state—The Peabody Teachers' College. The best known teaching authorities of this, and several other states, will put them into best possible shape and they will be distributed in printed form this fall to every teacher in Tennessee.

At another of our teachers' colleges, the one situated in East Tennessee, the whole theme and discussion of work during the summer months will be conservation and conservation teaching. 150 selected teachers will go over all available teaching material in an effort to produce better teaching units for use in the schools. It is our hope as years go by, these groups will continue each summer to evaluate and study the teaching materials that have been used to date and make changes that will increase its efficiency. Conservation Department personnel meet with these groups at every opportunity. We do not tell them how to teach conservation but we tell them what we as conservation experts know should be taught. In this way we are assured that the right kind of subject matter is being used.

In an effort to increase interest among teachers in the use of teaching units, we have selected 300 schools, evenly distributed throughout the state, where conservation teaching by the unit method will be used during the coming year in every grade and in every course. In short, these schools will be demonstration schools—schools where proper conservation teaching is demonstrated. Through the use of our conservation trailer and visits from Department personnel, we will work very closely with these selected teachers. In order to make the work in these particular schools of the highest possible calibre, in connection with about one-third of the selected demonstration schools, we will have demonstration forests and game areas where the teachers and students can work out in the open and observe the things that we are trying to get over to them. Our demonstration schools are being selected by the Commissioner of Education of Tennessee. The response among the teachers has been so great that our only problem to date has been limiting the number to 300. Teachers from these demonstration schools will report upon their work at the regular county teachers' meeting so that other teachers will know what is being done and will see some of the possibilities along this line.

Next year we believe that it will be possible to have at least 1,000 schools where conservation will be taught in this same manner. The key note of our whole program as I have explained it, is to get teachers and teaching authorities to realize their responsibility in teaching the proper use of our environment. Conservation education is a lot more than telling students where the fish hatchery and game farms are situated and how they are operated. That, frankly, is one of the least important phases of conservation as we see in teaching it. We are trying to have our teachers teach conservation as the proper use of the land, teach the realization of man's utter dependence upon his environment. Our motto is: "The proper use of every acre and every acre in proper use." We consider the Department of Conservation as merely the activating agent in conservation teaching. We might be well likened to catalyzing agents.

It is our job to hasten the reaction—to sell the teaching authorities on the job we want them to do, to speed it up when necessary and to see that the proper subject matter is taught.

To back up the teaching of conservation in the schools is our job. To do that we must produce a large amount of factual material—teachers and students alike should be able to write to our Department and receive publications that will answer pertinent questions on conservation. With this fact in mind—we are preparing a large amount of material on forestry, soil conservation, game and fish, etc., which is available to the teachers and to the students. We will make continued and thorough use of our conservation trailer visiting particularly schools where conservation teaching is taking place. We believe there is an important place for visual education in this program. The U. S. Department of Agriculture has, as you all know, produced fine motion pictures and film strips relative to conservation. However, we feel that to do our job right it is now time to produce our own movies and our own film strips, dealing with our local problems.

Motion pictures of the great fires in the Northwest are interesting and instructive but movies of our own forestry problems will be worth a lot more to us in our state. We have employed then as a part of our educational personnel a full-time photographer whose duty it is to make films and film strips of educational value showing our own pressing and important conservation problems. This work, we are glad to say, has been going on now for nearly nine months and we believe that these visual aids will be of far greater service and use to us than those that we can get from the Federal Government or from other states. We are making all of our visual teaching aids, motion pictures, still pictures, panels, exhibits of various kinds, available to schools in lending units. We hope to have by fall a series of lending units of stuffed birds which may be sent to schools, studied for several days then passed on to the next school. We feel that the Department of Conservation in every state has a big responsibility in supplying everything possible to make teaching of conservation easier and better.

In closing I would like to make one or two suggestions—one of our great difficulties in initiating the program I have outlined has been inadequate help—incomplete knowledge of what other states are doing. I believe the time has come when there should be a gathering of people interested in conservation education, a conference we might say, where educators and conservation administrators meet on equal footing to confer on programs, to discuss and to pass on interesting and helpful information. I realize that there have been several such conferences to date but their success has been questionable.

I am young in this matter of conservation but I have attended large conservation conferences and at not one of these has there been in attendance any educators, any men whose job it is to teach. I would like very much to see a conference where conservationists and educators could meet on equal footing in a discussion of this most important problem facing conservationists. Out of such a meeting could grow an organization that would pass on information to its members—it would help them in setting up educational programs and perhaps itself initiate the development of teaching units. I know that had there been any such organization two or three years ago we would be, in Tennessee anyway, just that much ahead of our program.

Honking geese continued their flight southward after a "forced landing" on the Alexander airport assisted by modern aids to aviation.

Airport attendants heard the flock circle the landing field last night. They decided the flock was air locked—unable to find a landing field—and ordered the floodlights turned on.

The flock settled, apparently exhausted, rested and then took off again.

Plants exceed animals in the length and shortness of their lives. Parrots may live longer than a century, elephants may live two centuries and apparently whales live several centuries. The Sequoias of California outlive them by attaining an age of fifty centuries. Certain bacteria have a life cycle of only 20 minutes, which is shorter than the life of any animal.—*From The American Wildlife Institute.*

It is surprising that so few people understand that deer feed primarily on succulent foliage and sprouts, and not grass. They *browse*, not graze.

Iowa and Ohio are now numbered among the states which have established special hunting preserves for archers only.

THE SIX-WEEK OLD PHEASANT PROGRAM

(Continued from Page 5)

Chapin's Grow-all Kernels or any high grade commercial growing mash of high protein content and kept continually before the birds. Filling feeders only half prevents the pheasants from wasting large amounts by billing it on the ground.

Grain feedings in the evening are necessary for carrying birds through the long nights. An evening feeding of wheat, buckwheat, oats and cracked corn should be broadcast on the ground each day, feeding just enough for the birds to clean up before dark. In this way the birds become accustomed to rustling for their food as they will have to do when liberated, and it also provides valuable exercise. In winter, if the ground becomes bare and frozen, spread some straw or hay in the pens and scatter your grain therein.

These grains should be fed in the following proportions:

¼ cracked corn ¼ buckwheat
¼ wheat ¼ oats

Grit and charcoal, which may be fed in ordinary wall poultry containers, must be kept before the birds at all times.

Ringneck pheasants are extremely fond of insects, including Japanese beetles, Bean beetles, Grasshoppers, Spiders, Ants, etc., and prefer these and other insects to any other kind of food. If there are Japanese beetles in your section it will pay you to trap these destructive insects in the inexpensive glass jar traps available at your local hardware store. When the jar is ¼ full of beetles, fill it full of cold water and dump the contents on the ground in your pheasant pens. The water soaks the beetles' wings, preventing flight, and the birds soon devour them.

In freezing winter weather it will be necessary to remove all water from the glazed fountains after the evening feeding of grain, filling them again in the morning. Good sized agate or enamelware pans about five inches deep may be substituted for the earthenware fountains during the winter. These cost very little and the ice is easily removed from them.

Complete sanitation within and around the holding pens must be practiced at all times. *This is very important.*

Feed spilled or billed out of the feeders must never be left to sour and mould on the ground, and must be removed each day. If your birds gain access to sour or mouldy feed you will probably lose every one of them.

Feeders and fountains must be kept clean and should be scrubbed and disinfected regularly. The regular BK poultry disinfectant is satisfactory for this purpose.

When a severe winter is encountered and the cover in your pens is depleted, shelters of corn fodder or evergreen branches can be provided. These may be stacked in the corners of single pens and against the centre division of double pens. Always provide two openings at the bottom so the birds can see daylight ahead.

Handling and Netting Birds

Pheasants should not be handled any more than is absolutely necessary. The birds are easily injured in netting and handling, unless great care is exercised.

For catching your birds, a regular gaff net frame such as those used by fishermen should be provided, having a handle at least six feet in length. The frame diameter should measure at least 14 to 16 inches. The net attached to this frame should be very sturdily constructed and of generous depth (from 28 to 30 inches). The net should be closely woven with no larger than ¼" mesh at the bottom portion and ½" mesh at the top.

Pheasants are easiest netted when running along the base boards of your pen. They may often be safely netted as they jump or fly in the corners. Always endeavor to net your bird with a "side sweep" of the net. *Never* bring the net straight down on your bird and always be going in the opposite direction from the one in which you intend the bird shall go. When he has entered the net, a twist of your wrist will prevent escape.

Pheasants may be handled without injury in several ways but the easiest hold is to grip the bird firmly by the two legs just *above* the leg joint (never below), placing your free hand gently but firmly across the back, holding the wings in place with your thumb and fingers. Hold the bird close to you as you do this. Never bring hard pressure on any portion of the bird's body as this is certain to cause injury. Practice makes perfect in handling birds as it does in everything else.

Treatments and Remedies

Prevention is always better than cure, and this particularly applies to the difficulties encountered in raising game birds.

Feather picking and gapes are the only afflictions which are likely to be encountered when rearing pheasants from six weeks of age. With pens constructed in accordance with Commission specifications, and with the birds receiving the prescribed diet and care, feather picking should never start. If it does, North Carolina Pine Tar, which can be purchased at any hardware store, should be immediately applied to the bird's back and rump (where picking is first suffered) and should be applied to every bird in the pen, not just to those afflicted. Plenty of roosting places, corn fodder and evergreen boughs, all of which furnish havens for escape, should be provided in the pen.

Gapes is an infection carried by earth worms, and this parasite multiplies in wet clay type soil and during protracted rainy periods. The Gape worm is red, shaped like a question mark, and attacks the bird in the windpipe. A bird so afflicted will gap at regular intervals (as a person yawns), and as the infection increases in severity it will sneeze and cough in an endeavor to rid itself of the parasites.

An excellent prevention and treatment in the early stages is to place just enough turpentine to cover the *surface* of the water, in each fountain daily. This treatment, when given in time, usually solves the problem.

If the infection persists and increases in severity, apply a dusting of Spratt's Blackerite, carefully following directions given by the manufacturer. This remedy can be obtained from Spratt's Ltd., Newark, N. J.

Liberating the Birds

Only birds which are sound, healthy and full-winged can be liberated. Unsound or partially winged pheasants fall early prey to vermin and unhealthy birds will be certain to contaminate the wild stock with serious results.

Young pheasants from 12 to 16 weeks old, liberated in the late summer are best released in standing corn or in clover or other crop fields adjacent to good cover. Whenever possible, it is best to release young birds while insects are still abundant, as the birds will subsist almost entirely on these while becoming adapted to the wild state.

Spring liberations must be made between March 1st and 20th and the birds should be released in sections where native pheasants have been known to feed and water during the winter. This will give your birds a start where their two necessities of life, food and cover, are sure to be available.

The six-week old pheasant program of co-operative game propagation by the Game Commission and organized sportsmen will improve and increase your gunning if properly carried on. By adherence to the Commission's rules, regulations and specifications, and by following the propagation instructions carefully, you will contribute your large share toward better pheasant hunting than the Keystone State has yet known.

THE MAIL BAG

"May I toss a few bouquets in recognition of the great strides you have made with the GAME NEWS. It is not only a more readable paper for hunter and non-hunter alike, but the intelligent handling of the trick problem of conservation is bound to help close the breach between the two camps."—Philip A. Livingston, Narberth, Pa.

"The constructive tone of the GAME NEWS has contributed greatly, in my opinion, to the advance in wildlife restoration throughout the country in recent years and to a greater interest in the conservation of the natural resources of not only Pennsylvania but all other states of the Union."—E. P. Cuningham, Wilmington, Del.

SPECIAL NOTICE

We sincerely apologize for the delay in publication of the new "Wildlife" bulletin offered with each two-year subscription of the GAME NEWS. There apparently has been some difficulty about getting the engravings to register properly, although we expect shortly to learn that the books are completed. The process is being run in six colors to insure the most correct reproduction possible and we feel sure you will be more than compensated for this long wait when the bulletin finally reaches you.

A RARE WINTER VISITOR—THE ROUGH-LEGGED HAWK

By DR. GEORGE MIKSCH SUTTON

THIS large eagle-like bird is a rare winter visitor or late migrant in Pennsylvania. Its slow flight is rather owl-like, and more than likely when it is observed hereabouts, it will be seen beating about the open fields, not far from the ground.

Rough-legs occur in two distinct phases of plumage—one known as the light or normal phase, and one the black or melanistic phase. In the latter phase the plumage is very dark brown, relieved only by the yellow feet and base of bill, and a whitish bar on the base of the tail. In the normal plumage the head, neck and breast are light buffy color streaked with dark, and the upper parts are warmer brown. The tail is prominently banded toward the tip. The underparts, however, are almost entirely black, from the breast down. In all plumages the bird's feet are feathered down to the toes, however. This characteristic, which is like that of the Golden Eagle, will serve to identify the bird in any plumage.

In Labrador, when the birds nest, they are known as "Eerts." They are quite common, and are, strangely enough, killed and eaten for food! Never having eaten one I cannot say that they are much of a delicacy.

Their nests are built on high cliffs, often in inaccessible places. Their sets of eggs are large, being often as large as six or seven. The eggs are strikingly marked with blotches of deep brown. The young birds which are downy white with pale gray feet and dusky eyes, are most attractive. During their first days of development they peep very much like little chickens. They are fed principally on mice, and almost never on birds. In fact the big Rough-legged Hawk is almost altogether a harmless species of bird and deserves protection.

The call of this bird, which has been given the name "Archibuteo" by the scientists, resembles that of the Red-tailed and Red-shouldered Hawks to a degree, but it is much clearer and louder, and has a peculiar ringing musical quality when heard in its native home along the Labrador coast.

A 30.30 SPEAKS—By Thomas Witherspoon

HI YA, fellars, well hyar I am again ole thirty thirty himself, all set to do a little chinin.

Ya see, I wuz a-talking with ole grandpap, K. Long Rifle, and believe me, that thar ole fellar shore can spin some tall ole yarns, and as he's a been in the boss's family fer generations, we sort a let him get away with em.

Wall, this hyar day I was a sort of kiddin him about Kaintucky, and how twaz too bad he weren't a Pennsylvanian, and no more than gut them thar words outen my mouth till he hops all over'en me.

Look hyar, young fellar, he sez, I'll have ye know I'm moren a Pennsylvanian than yow be. I wuz a borned rite down thar in Lanchester, Pa., and twuz us Pennsylvanians what settled ole Kaintucky, that air the reason they called us kaintucky longs.

All the settlers what went thar toted us with em, an when I sez toted, I mean toted, why in them thar days a fellar would just as lief went to church without his britches, as go thar without us.

Yes, suh son! Many a time I seed and heerd them redskins come a hoopin outen the woods.

Yea sez I, but did ya ever do any hunten in Pennsylvainy in yore young days? I knowed if I let him run on about fightin Injuns I jest never cud get him stopped fer hours.

Dag nab it, sez he, if you young bucks don't ask the dangdest questions, why son, I've hunted and traveled this hyar state frum A to izzard and seen more things than yow ever hurd of, and danged if I don't tell you sumthin I seed happen rite hyar in Pennsylvainy.

We was a liven out thar in Kaintucky, but one day the boss sez to his Mrs. that he was hankerin to go back to Pennsylvainy, so he packs the Mrs. and younguns in an ox cart and heads fer home. Well ater a couple months travel we cum to Fort Pitt, it wore jest a little settlement in them thar days.

While we air thar my boss, he meets an ole trapper friend, he tells the boss about some territory along the Tionesta Creek so the boss reckons to go look it over.

Wall, he leaves the ole woman and youngest brats at the settlement and takes the oldest lad and sets out fer the Tionesta. Now I've a traveled all over this hyar country and I ain't never seen more beautiful scenery than when we made that thar trip.

Wall, one morning the ole man sez to the lad, "Son I crave squirrel. Take old Patch (That wore me) an go fetch sum fer breakfast. The youngun picks me up, tates me over his shoulder, we ain't gone fur an I see him a looking up in a bunch of pines, course I looks up and see a big ole black squirrel up thar in top of one of them thar pines.

Wall, the lad sees him and gets me up to his shoulder, lines up my front sight "Wham" I speaks rite out, and I no moren speaks, till thars the gosh awfulist rukus ye ever heerd. Limbs fallen hyar, branches fallen thar, till I thought the hull forest was cumin down.

The ole man comes a runin frum camp to see what all the rukus is, jest as he gits thar sumpin hits the ground with a thud, we rushes over to see what it wore, and dag nab it if thar didn't lay a four hundred pound black bear deader than a mackeral. Gol dern it them thar trees wore so tall that thar bear just looked like a little ole squirrel way up thar.

Wall now, fellars, Grandpap K. Long Rifle kinda stretches the truth now an then, but if it is the truth fifty years frum now a fellar that hunts squirrels in Pennsylvany will have to carry high power glasses so he won't be a shootin bear outen season, cause our state shore is putin the conservashun of forests over with a bang.

WITH THE CLUBS

NEW CLUBS

Bunola Rod and Gun Club, Bunola, Pa. William Lewis, Secretary.

Members of the Palmyra Sportsmen's Association organized a corn husking bee on the farm of Mr. Harold Brandt. Mr. Brandt had been confined to a hospital with a broken leg, and the local sportsmen's clubs got together and helped him out. That's what you call real spirit. At the end of the job Dan Wolf, restaurant owner of Palmyra, treated the group to refreshments.

The Izaak Walton League of Schuylkill County is offering $100 in prizes for building winter feeding shelters and bird houses. The contest is known as The First Annual Scout Conservation Project sponsored by the Izaak Walton League and promoted by the Local Scout Council. Only scout troops and lone scout patrols of Schuylkill County are eligible to enter. The set-up of the program is a very good one and it is suggested that other organizations interested in carrying on similar projects, write the League or the Department of Forests and Waters, 6 North Center Street, Pottsville, for sample.

The Morrisville Fish and Game Protective Association announces the formation of a Junior organization for boys between 12 and 16 years of age. It is the desire of the parent organization to teach the boys the principles of Safety, Good Sportsmanship and Conservation of Wildlife. A cordial invitation to all boys in the Morrisville area to meet at the Club Rooms in the Morrisville Community House is extended.

SPORTSMEN'S QUERIES

By CHAS. F. STAMBAUGH

KEEPING SKUNKS IN CAPTIVITY

Q. Is it permissible to keep a skunk in captivity at any time during the open or closed season?

F.H.I.—Emaus, Pa.

A. Skunks taken legally during the open season may be possessed alive indefinitely without a permit. We advise against keeping them in towns or cities where they may become annoying to residents.

* * *

TRANSPORTING DEER KILLED BY ANOTHER

Q. Is it lawful to transport a deer legally killed by another hunter, if the deer has been tagged as required by law?

"Deer Hunter"

A. Yes, it is. If the deer is tagged showing the name and address of the owner (the person who legally killed it), his license number and the county in which the deer was killed, it may be conveyed in an automobile or otherwise by any person *within the Commonwealth.* However, any person possessing wild game has a certain amount of responsibility as to the legality of such game.

* * *

HUNTING ON "PRIVATE GAME REFUGES"

Q. If a tract of land is surrounded by a single strand of wire and posted with notices reading "Private Game Refuge, No Hunting, Trapping, Fishing or Trespassing," may anyone hunt on this land with permission of the owner?

J.J.T.—Mineral Point, Pa.

A. Yes. Unless a Game Refuge is officially established and marked by the Pennsylvania Game Commission, the owner of lands marked as above may permit any person to hunt within the "refuge" whom he desires. A landowner has absolute jurisdiction over hunting rights on his property.

* * *

RESIDENT REMOVING DEER FROM PENNSYLVANIA

Q. I am a resident of Pennsylvania, now employed in New York State. Could you give me a written permit to bring a doe into New York?

A.M.G.—Syracuse, N. Y.

A. Sorry, but we cannot. Any deer or other game killed in Pennsylvania under a resident license cannot be removed from the Commonwealth and must be consumed within the State. No permits can be issued for the removal of game under these conditions.

ELIMINATION OF MAGAZINE SHOTGUNS

Q. Does the Game Commission intend to sponsor legislation which will eliminate magazine shotguns entirely in Pennsylvania?

"Interested Sportsman".

A. Absolutely not. The Commission has never favored legislation which would automatically compel a lot of hunters to throw their firearms into the river. The present three-shot restriction on magazine shotguns seems to be working out very satisfactorily.

* * *

LEGALITY OF BUCKS WITH SHED ANTLERS

Q. If a hunter kills a buck deer that has shed its horns, will it be legal?

A.G.—Clymer, Pa.

A. Yes, in the 1938 antlerless deer season. Of course, the buck must have lost its horns before the hunter shoots at it. The regulations provided for the killing of all antlerless deer, and after a buck had dropped his antlers he became legal game.

* * *

MILITARY SERVICE AND HUNTING RIGHTS

Q. My duties as a Medical Officer in the U. S. Navy have carried me to Norfolk, Virginia. My legal address as carried in the Navy files is Philadelphia, Pa. Am I entitled to a Resident Hunter's License in Pennsylvania?

H.H.E.—Norfolk, Va.

A. Under those conditions, you are. The Constitution of Pennsylvania provides that a citizen of this State who enlists in the military or naval service of the United States does not lose his claim to residence in Pennsylvania by reason of absence from the State in such service, so long as he continues to claim this State as his legal residence.

* * *

HUNTING SKUNKS AT NIGHT

Q. Is it legal to hunt skunks at night with a light and a club?

H.N.—Pottstown, Pa.

A. With a light, no; with a club, yes. However, to wield a club at night without a light is a rather hazardous undertaking, and I would not care to accompany you on a hunt of that kind. Raccoons are the only animals that may be hunted at night with lights.

LANDOWNER HUNTING ON HIS OWN POSTED LANDS

Q. If a person posts trespass notices on his property to keep off deer hunters, does he have the right to hunt on that land, and adjoining properties, including State land, without a license?

W.P.—Allenwood, Pa.

A. Posting one's own property does not prevent him from hunting for game in season without a license on those grounds if he resides upon and cultivates them. Unfortunately, the law does not prevent him from hunting on adjoining lands, if he has the owners' consent, except that he may not hunt on State lands for the reason that the State will not allow any hunting without license on Stateowned lands. In our judgment, any farmer or landowner who posts his own property against hunting, should not expect the courtesy of hunting to be extended to him by neighbors. This practice is entirely too prevalent in Pennsylvania.

* * *

POSTING OF LAND TO PROHIBIT HUNTING

Q. As a sportsman, I like to abide by the law and do not want to trespass where I should not. Just how should land be posted against trespass? What is the fine?

K.H.M.—Elkland, Pa.

A. The Pennsylvania Trespass Laws do not specify definitely just how lands shall be posted to prohibit trespass. There are two Trespass Laws now in effect in this State, the Acts of 1901 and 1905, the latter being the one most commonly used. Under the Act of 1905, to legally prohibit trespass, *the owner of the land* is required to prominently post upon said land, printed notices that the land is private property, and warning all persons against trespassing thereon. This is the limit to which the law goes in specifying how posters shall be placed. They must, however, be posted by the owner or owners, so that a lessee or tenant has no right to post land. Offenders are liable to a penalty of not more than $10.00.

* * *

DUCK HUNTING WITH RIFLES PROHIBITED

Q. May I go hunting with a 22-Cal. rifle for wild ducks?

S.S.—Pennsburg, Pa.

A. Sorry, but you cannot. The present regulations as given us by the Federal authorities and officially adopted by the Pennsylvania Game Commission, require the use of a shotgun not larger than 10-Gauge, only, on wild waterfowl, and you must refrain from using a .22 rifle.

PHOTOS OF EXHIBIT CASES AT PYMATUNING MUSEUM, CRAWFORD COUNTY

OTHER PHOTOS WILL APPEAR IN SUBSEQUENT ISSUES

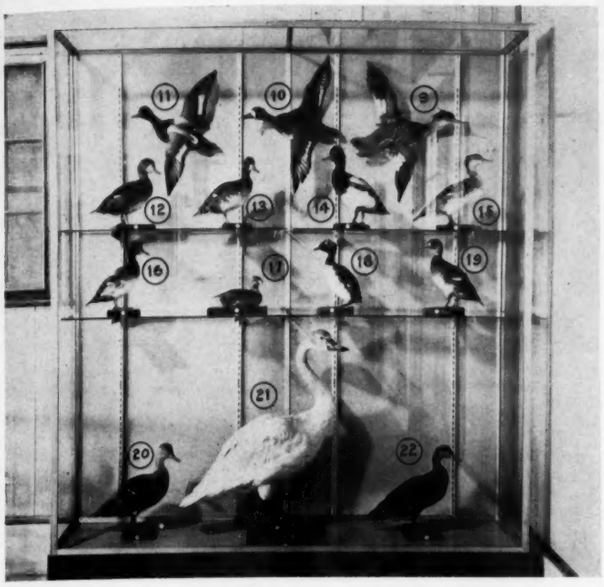


EXHIBIT CASE NUMBER 1

Specimen Number	Common Name	Sex	Season Plumage
9	Red-breasted Merganser	Female	Spring
10	Lesser Scaup Duck	Female	Spring
11	Lesser Scaup Duck	Male	Spring
12	Greater Scaup Duck	Female	Fall
13	Lesser Scaup Duck	Female	Spring
14	Lesser Scaup Duck	Male	Spring
15	Red-breasted Merganser	Female	Fall
16	Lesser Scaup Duck	Male	Fall
17	Pied-billed Grebe	Female	Summer
18	Horned Grebe	Male	Spring
19	Lesser Scaup Duck	Female	Fall
20	Mallard & Black Cross?	Female	Fall
21	Whistling Swan	Male	Spring
22	Black Duck	Female	Spring

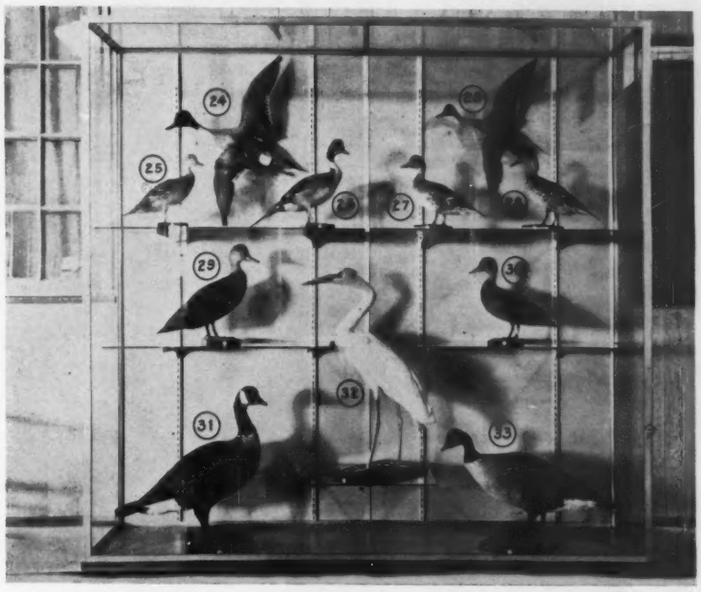


EXHIBIT CASE NUMBER 2

Specimen Number	Common Name	Sex	Season Plumage
23	Pintail Duck	Female	Spring
24	Pintail Duck	Male	Spring
25	Pintail Duck	Female	Fall
26	Pintail Duck	Male	Spring
27	Pintail Duck	Female	Fall
28	Pintail Duck	Female	Spring
29	Black Duck	Male	Fall
30	Black Duck	Female	Fall
31	Canada Goose	Male	Spring
32	Great White Heron	Female	Spring
33	Canada Goose	Female	Spring

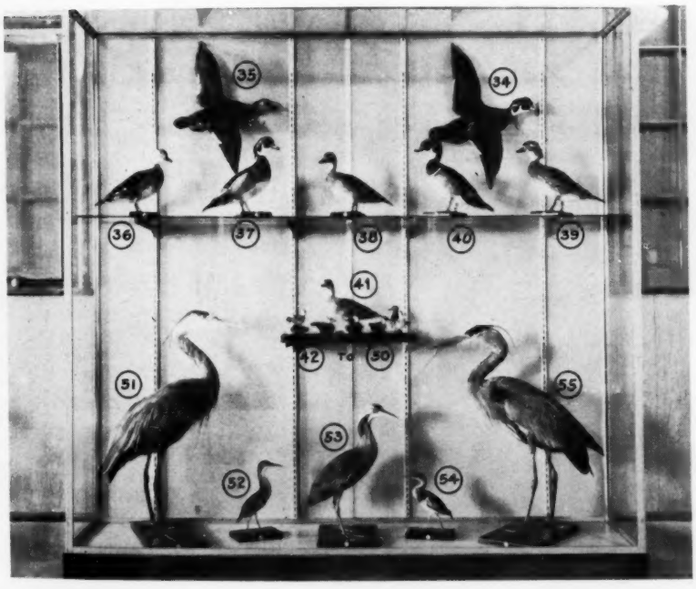


EXHIBIT CASE NUMBER 3

Specimen Number	Common Name	Sex	Season Plumage
34	Wood Duck	Male	Spring
35	Wood Duck	Female	Spring
36	Wood Duck	Female	Fall
37	Wood Duck	Male	Fall
38	Wood Duck	Female	Fall
39	Wood Duck	Female	Fall
40	Wood Duck	Male	Fall
41	Blue-winged Teal	Female	Summer
42-50	Blue-winged Teal	Ducklings	Summer
51	Great Blue Heron	Male	Spring
52	Least Bittern	Male	Spring
53	American Bittern	Male	Spring
54	Least Bittern	Male	Spring
55	Great Blue Heron	Male	Spring

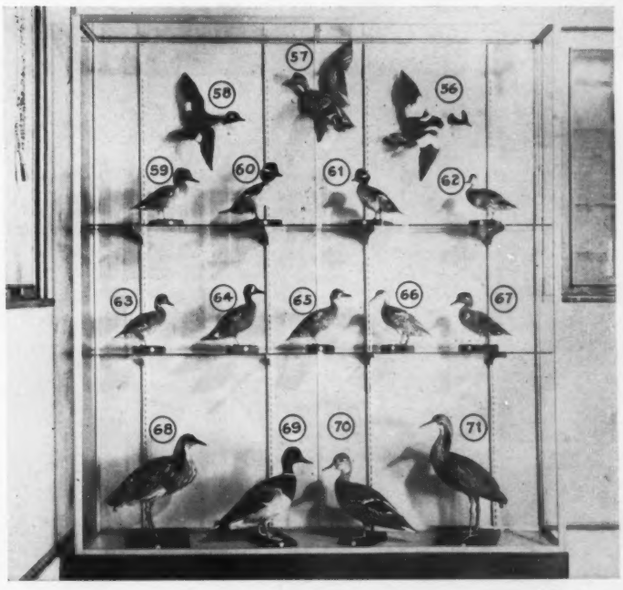


EXHIBIT CASE NUMBER 4

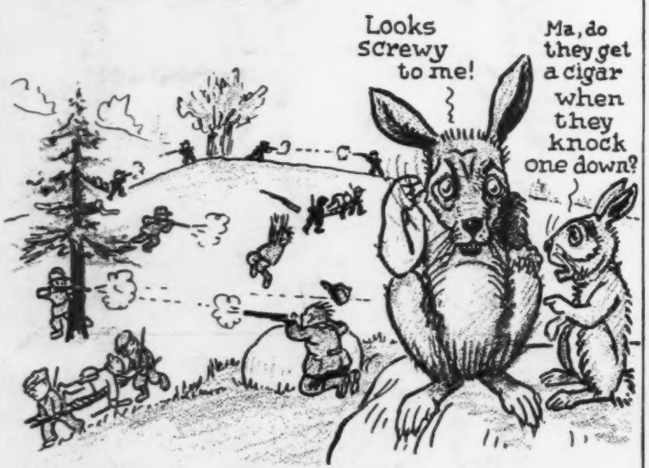
Specimen Number	Common Name	Sex	Season Plumage
56	Buffle-head	Male	Spring
57	Green-winged Teal	Male	Spring
58	Buffle-head	Female	Spring
59	Green-winged Teal	Male	Spring
60	Buffle-head	Female	Spring
61	Buffle-head	Female	Spring
62	Green-winged Teal	Female	Spring
63	Green-winged Teal	Female	Spring
64	Blue-winged Teal	Male	Spring
65	Blue-winged Teal	Female	Fall
66	Blue-winged Teal	Female	Spring
67	Green-winged Teal	Male	Spring
68	American Bittern	Male	Spring
69	Mallard Duck	Male	Fall
70	Mallard Duck	Female	Fall
71	American Bittern	Male	Spring

Television Shots from Pennsylvania's Game Season

Jed Wisenhoffer, Pike County farmer plants an iron deer to draw gunners' fire, thereby saving his family and stock from assassination.

Dave Crockett, Tunkhannock bear hunter thinks you can get anything you wish if you wish hard enough. This season he overwished!

Farm-game plan works better than expected. Mars Penna. farmer not only invites gunners to hunt on his land but to join him at dinner!



John Bunny & son of Colonial Village, Wayne trying to figure what all the shooting is about

Hy Eage

Imagine his embarrassment! Hank Todd trapped a beaver which proved to be a U.S. Government employee on a nearby dam project!